COMMONWEALTH MYCOLOGICAL INSTITUTE

C. A. B.
9 APR 1953
FILE

REVIEW
OF
APPLIED MYCOLOGY

VOL. XXXII MARCH 1953

ZOGG (H.). **Über ein neues, Uredo-bildendes Gymnosporangium : Gymnosporangium gaeumanni n. sp.** [On a new, uredo-forming *Gymnosporangium*: *Gymnosporangium gaeumanni* n. sp.]—*Ber. schweiz. bot. Ges.*, 59, pp. 421–426, 4 figs., 1949. [Received July, 1952.]

Gymnosporangium gaeumanni n. sp., parasitic on *Juniperus communis* ssp. *nana* leaves in the Rhaetian Alps, Switzerland, is characterized by cinnamon-coloured to blackish-brown uredo- and teleutosori, 0·5 to 1·5 by 0·3 to 1 mm.; subglobose, ellipsoid, or globose, verrucose, light brown or brown uredospores (19) 21 to 25 (31) by (16) 20 to 23 (25) μ; and ellipsoid, fusiform or irregular, smooth, brown teleutospores (25) 33 to 46 (58) by (16) 25 to 33 (41) μ.

MCCLEAN (A. P. D.). **Cauliflower mosaic and Cabbage black ringspot, two virus diseases that attack Cauliflower, Cabbages and other plants.**—*Fmg in S. Afr.*, 27, 313, pp. 251–253, 7 figs., 1952.

Crucifers in South Africa are attacked by cauliflower mosaic virus [*R.A.M.*, 29, p. 449] and cabbage black ring spot virus [ibid., 28, p. 511], particularly in market gardens around Johannesburg and Pretoria. Other hosts of black ring spot are Brussels sprouts, sprouting broccoli, curly kale, and turnip, which develop symptoms similar to those on cabbage and cauliflower.

TSUYAMA (H.) & SAKAMOTO (M.). **Isolation methods of the soft-rot causing bacteria from the soil.**—*Rep. Inst. agric. Res. Tôhoku Univ.*, 3, pp. 29–34, 1951.

In further studies on the seasonal trend in the numbers of soft-rot bacteria in field soil at Tôhoku, Japan [*R.A.M.*, 31, p. 175], *Erwinia aroideae* [strain of *E. carotovora*: cf. ibid., 28, p. 500; 31, p. 594], causing serious damage to Chinese cabbage (*Brassica pekinensis*) throughout Japan, particularly in the north, was isolated from soil by the indirect and direct methods of Leach [ibid., 9, p. 670] and Patel [ibid., 8, p. 554], respectively. For the former method carrot slices, 0·5 to 1 cm. thick, sterilized for 30 minutes in 0·1 per cent. mercuric chloride, were incubated in a moist chamber at 30° C. with inoculum consisting of disks from a bouillon agar culture in which had been incorporated a diluted soil sample. After two and four days the rotted carrot slices were crushed, diluted with sterilized water, and the mixture added to modified Drigalski's medium (bouillon agar containing 10 gm. lactose or glucose, 5 ml. 0·1 per cent. crystal violet, and 40 ml. 0·2 per cent. bromthymol blue per l.). In the second method the bacteria were isolated directly from field soil on modified Drigalski's medium, on which colonies of the rot bacterium appeared first as yellow nuclei with a transparent margin, then turned greenish yellow, and finally green to blue. The concentrations of diluted soil solutions used were 10^{-5} and 10^{-6}. Isolates were tested for their rot-causing abilities by carrot-slice tests.

By the first method the bacteria were detected best after 96 hours' incubation with soil dilutions of 10^{-1} to 10^{-3}. The highest numbers of rot bacteria were obtained from mid-June to mid-July. From then until the end of September very few were detected. In October and November the numbers rose again but not to the former high level.

By the second method soft rot bacteria constituted 17·4 per cent. of the total isolates and were absent in July, August, and December.

Tochinai (Y.) & Sawada (K.). **Observations on the overwintering of the Bean anthracnose fungus, Colletotrichum lindemuthianum Briosi et Cavara.**—*Mem. Fac. Agric. Hokkaido*, 1, 2, pp. 103–112, 2 figs., 1952. [Japanese, with English summary.]

In Japan spores of *Colletotrichum lindemuthianum* [C.M.I. map No. 177] from bean [*Phaseolus vulgaris*] were unable to live through the winter in a barn, indoors, or in soil. The fungus would, however, be able to overwinter in dry tissues, and affected material should accordingly be removed from the field. The fungus also lives at least two years in the seed [*R.A.M.*, 23, p. 208]. Secondary infection is probably caused by conidia from lesions on the cotyledons produced by primary, seed-borne infection.

Cruickshank (I. A. M.). **Pea wilt: field identification and varietal resistance.**—*N. Z. J. Agric.*, 84, 2, p. 144, 2 figs., 1952.

An additional list is given of pea varieties found to be resistant to wilt (*Fusarium orthoceras* var. *pisi*) [*R.A.M.*, 31, p. 528] during trials from 1948 to 1951 in New Zealand. Included in it are the garden varieties Alderman, Bliss Everbearing, Climax, Director, Epicure, Glaciator, Hurricane, Kelvedon Standby, Kelvedon Triumph, Lord Chancellor, Major, Morse's Market, Multipod, Progress, Queen, and Triumph, and the field varieties Gruno, Hala, Vinco, White Canada, Zelka I, and Zelka II. Control measures are indicated.

Wallace (G. B.) & Wallace (Maud M.). **Pea blight.**—*E. Afr. agric. J.*, 17, 3, p. 110, 1952.

The bacterium isolated from the blight of garden peas and sweet peas reported recently from Tanganyika Territory [*R.A.M.*, 31, p. 160] has been identified by Dr. W. J. Dowson and R. A. Lelliott of the Botany School, Cambridge, as a strain of *Pseudomonas pisi*. No further cases have occurred in the Moshi area, but outbreaks were found in November, 1951, in the Usambara Mountains, in gardens at Amani, and in two gardens above Lushoto. Pea blight has been declared a disease for the purposes of the Plant Protection Ordinance in Tanganyika [ibid., 10, p. 208].

Chamberlain (D. W.). **A halo-producing strain of Pseudomonas glycinea.**—*Phytopathology*, 42, 6, pp. 299–300, 1 fig., 1952.

The organism isolated in 1946 from watersoaked or necrotic spots surrounded by a pale green to yellow-white halo, 4 to 7 mm. in diameter, on the leaves of young soy-bean plants in central Illinois was demonstrated by inoculation experiments to be a strain of *Pseudomonas glycinea* [*P. glycines*], the cause of bacterial blight [*R.A.M.*, 30, pp. 258, 443], distinguishable from other isolates only by the capacity for halo formation. The conspicuous, yellowish halo, 4 to 5 mm. in diameter, developing on the second and third trifoliate leaves of Lincoln soy-bean plants eight days after inoculation contrasted with the pale green circle, 2·5 cm. in diameter, produced by *P. phaseolicola* on the second trifoliate leaves only. The Illini, Palmetto, Richland, Hawkeye, Earlyana, Gibson, Flambeau, Wisconsin-Manchu, Ogden, and CNS varieties also reacted positively to inoculation with *P. glycines*. At tempera-

tures of 18·5° to 28° C. the halos induced by this organism lost their identity two to three weeks after inoculation and the lesions became typical of bacterial blight.

Halo spot was not observed in Illinois from 1947 to 1949, inclusive. Isolates procured in 1949 from typical bacterial blight lesions in Minnesota, Wisconsin, and Germany all produced similar symptoms on the first trifoliate leaves of soy-bean plants, but halo formation was restricted to the Wisconsin strain. All the isolates caused marginal chlorosis of the second trifoliate leaf, particularly the Wisconsin strain. This symptom is considered, therefore, to be too general to serve as a diagnostic criterion for the differentiation of soy-bean bacterial pathogens.

Hoffman (J. R.). **Leaf hopper control to prevent the spread of the virus disease aster yellows in commercial Lettuce production : part II.**—*Quart. Bull. Mich. agric. Exp. Sta.*, 34, 3, pp. 262–265, 1952.

In trials at Trapp and Sons' farm, Beulah, Michigan, in 1951 an application of parathion (1 lb. 15 per cent. wettable powder per 100 gals.) or Experimental Insecticide 4049 (1 lb. 25 per cent.) produced by the American Cyanamid Co., New York, plus heavy applications of the former and DDT (1½ pt. 25 per cent. emulsifiable or 2 lb. 50 per cent. wettable powder) to the surrounding weed borders gave good control of *Macrosteles divisus* [*R.A.M.*, 31, pp. 318, 475] and lowered the incidence of aster yellows virus on lettuce [ibid., 30, pp. 26, 372]. The percentage of plants with yellows symptoms was reduced from 10·6 to 7·4 on the Great Lakes variety and from 11·6 to 6·2 and 6·6 on the 456 variety.

Attention is drawn to the importance of treating the weed borders for obtaining a successful control. The treatment, which is on the whole reasonably economical, appears to be desirable commercially.

Krause (W. G. C.). **Tipburn on early Lettuce.**—*Comm. Gr.* (formerly *Fruit Gr.*), *1952*, 2971, pp. 1043–1044, 1952.

A brief description is given of lettuce tipburn [*R.A.M.*, 31, p. 588] which, though rather rare in England, should be carefully investigated. Attention is drawn to the importance of maintaining a constant atmospheric humidity and proper ventilation in the greenhouse.

Ramsey (G. B.), Smith (M. A.), & Wright (W. R.). **Orange rust, a serious market disease of Colorado Spinach in 1952.**—*Plant Dis. Reptr*, 36, 8, pp. 323–324, 1 fig., 1952. [Multilithed.]

In May, 1952, orange rust (*Puccinia aristidae*) [*R.A.M.*, 24, p. 134] of spinach caused serious loss in truck shipments from Denver, Colorado, to Chicago. On arrival on the third morning after despatch 309 crates in an insulated semi-trailer truck refrigerated with top ice still had 2 to 8 in. of crushed ice over the top; top and bottom doorway temperatures were 35° and 37° F., respectively. Average infection was 80 per cent., the lesions being numerous and very small (1 to 3 mm. in diameter), and the whole load was unmarketable. It appears that with the usual methods of handling spinach in Colorado an appreciable change in condition may be expected to occur during transit and marketing when rust infections are severe.

Mahmud (K. A.). **Pythium damping-off of Brinjal seedlings.**—*Sci. & Cult.*, 18, 3, pp. 149–150, 1952.

Pythium aphanidermatum, not previously recorded on eggplant [*R.A.M.*, 30, p. 446] in India, was detected on 10 to 70 per cent. of the plants in different beds at a Nagpur nursery in 1948. Pathogenicity tests on autoclaved soil in pots gave 100 per cent. positive results.

López Navas (J. T.). **Algo sobre el cultivo de la Yuca en Venezuela.** [Notes on the cultivation of Yuca in Venezuela.]—*Agricultor venezol.*, 17, 154, pp. 14–16, 1 fig., 1952.

Yuca [cassava] plants in Venezuela are attacked by a degenerative virosis termed 'superbudding' [witches' broom: *R.A.M.*, 31, p. 419 and above, p. 91] characterized by extensive leaf production and rachitis and starch reduction in the roots. Control, as for mosaic [cassava mosaic virus: ibid., 29, p. 479; C.M.I. map No. 184], lies in burning diseased plants, and either sowing certified imported seed or quarantining it for a year and thereafter keeping the plants under observation.

T. M. T. D.—*Aust. dried Fruit News*, 27, 1, p. 19, 1952.

In preliminary trials carried out by the Victorian Department of Agriculture in the Mid-Murray Valley area vines were given the standard winter treatment of an acid iron swab or an acid swab, both followed by Bordeaux spray in spring, or Bordeaux in spring only, or thiram or thiotox (double-strength thiram). The percentages of black spot [*Elsinoe ampelina*: *R.A.M.*, 29, p. 402; 30, p. 99] were, respectively, 60, 47, 52, and 1, as against 95 for the untreated, the corresponding yields (per nine plots, mean of four repetitions) being 147, 115, 176, 187, and 48 lb. Growers who witnessed trials carried out by the Victorian Department of Agriculture in collaboration with the Nyah–Woorinen Enquiry Committee at the experimental farm 38–H expressed themselves convinced that thiotox controlled black spot in the 1950–51 season.

Limasset (P.). **Quelques remarques sur l'utilisation de la réaction de fixation du complément pour l'étude des maladies à virus des plantes.** [Some remarks on the use of the complement fixation reaction for the study of virus diseases of plants.]—*Ann. Inst. nat. Rech. agron.*, Sér. C. (*Ann. Épiphyt.*), 3, 1, pp. 83–101, 1952.

After discussing the principles upon which the complement fixation test is based the author describes in detail experiments carried out at the Central Station for Plant Pathology, Versailles, using Kolmer's method (J. A. Kolmer & F. Boerner: Approved laboratory technic. 4th ed., Appleton Century Croft, 1945) with tobacco mosaic virus and potato viruses X and Y from tobacco, the antigenic action of sap from healthy tobacco plants being studied by comparison, to estimate the sensitivity of the test [cf. *R.A.M.*, 28, p. 492]. The evidence obtained showed that the technique may be very useful for detecting small quantities of virus. It allows quantitative comparisons to be made, provided the two specimens to be compared are treated simultaneously, as one virus preparation may give different limits with the same serum in two successive dosages if the amount of complement of hæmolysin varies even slightly, or the duration or the temperature of fixation differs in the two tests. Another difficulty is that exact dosages cannot be made without using an excessive number of tubes. The dilution scales in geometric progression allow the virus concentration to be determined, but the micromethod of precipitation on slides gives more accurate results.

Plant diseases.—Two diseases of turf. Bitter pit of pome fruits.—*Agric. Gaz. N.S.W.*, 63, 4, pp. 200–203, 5 figs., 1952.

The most common diseases attacking turf in New South Wales are brown patch (*Rhizoctonia* [*Corticium*] *solani* and *Curvularia spicata*) [*R.A.M.*, 31, p. 330] and dollar spot (*Sclerotinia homoeocarpa*) [ibid., 29, p. 497; cf. below, p. 131]. The former disease has been present in the State for many years and all turf-forming grasses are susceptible to attack, particularly common bent (*Agrostis tenuis*). It generally appears in September or October and is likely to assume serious

proportions during summer and autumn, particularly if soil drainage is bad and the weather is continuously warm and moist. Treatment with inorganic mercury compounds [ibid., 31, p. 609] controls both diseases. Following treatment the grass should be watered and given fertilizers. It is important to treat either disease as soon as it appears and repeat as often as necessary. Cadmium compounds such as puraturf 177 [see below, p. 131] have proved effective for controlling dollar spot but not brown patch.

The information concerning bitter pit of pome fruits has already been noticed [cf. ibid., 26, p. 454].

WALLACE (G. B.). **1950 Annual Report of the Plant Pathologist, Lyamungu, Moshi.** —*Rep. Dep. Agric. Tanganyika, 1950*, pp. 167–172, 1952.

In this report [cf. *R.A.M.*, 31, p. 225] it is stated that bean [*Phaseolus vulgaris*] yeast spot (*Nematospora coryli*) [ibid., 31, p. 162] was very common in Tanganyika Territory in 1950. Coffee black bean, possibly the same as 'black jelloo' in India [ibid., 28, p. 572], was prevalent at Lyamungu. A mild form of cypress canker (*Monochaetia unicornis*) [cf. ibid., 32, p. 64] occurred near Tukuyu and still persists in the Usambaras. Lucerne was heavily infected by *Colletotrichum trifolii* [ibid., 30, p. 490] near Moshi, where rust (*Uromyces striatus*) [cf. ibid., 30, p. 309] was severe on the same host.

In the Southern Highlands Province *Coniothyrium* sp. caused a disease of pyrethrum [*Chrysanthemum cinerariifolium*] buds and flowers; *Sclerotinia sclerotiorum* was isolated from wilted plants at Uwemba. From a leaf spot of *Nicotiana rustica* in the Southern Highlands Province a bacterium provisionally identified as *Pseudomonas mellea* [cf. ibid., 28, p. 56] was isolated. *Fusarium oxysporum* was isolated from unthrifty wheat seedlings, infection probably being favoured by planting in unsuitable patches of soil. An injurious foot rot of wheat seedlings and a leaf spot of older plants were caused by *Helminthosporium sativum*. Of 17 wheat samples tested for stem rust [*Puccinia graminis*] form K9 [ibid., 32, p. 10] was present in 13; the only other form identified was K1 [loc. cit.].

New records include *Mycosphaerella rosigena* var. *madagascariensis* n. comb. on rose [cf. ibid., 27, p. 81; 30, p. 163] and *Puccinia antirrhini* and *Septoria antirrhini* on *Antirrhinum*.

Report of the Department of Development and Agriculture (Gambia) for the period 1st June, 1949 to 31st May, 1951.—27 pp., 1952.

In this report [cf. *R.A.M.*, 21, p. 65; 31, p. 315] it is stated that groundnut rosette disease [virus: C.M.I. map No. 49] was unusually severe in 1950 and in many areas caused low yields due possibly to late planting.

TARR (S. A. J.). **Plant pathology.**—*Rep. Res. Div. Minist. Agric., Sudan Govt, 1948–1949*, pp. 47–65, 1951.

In this report [cf. *R.A.M.*, 20, p. 162] it is stated that lubia (*Dolichos lablab*) sown in July in the Gezira was severely affected by bacterial blight (*Xanthomonas phaseoli*) [ibid., 17, p. 523], heavy rainfall facilitating extensive spread. In a resistance trial ECR/127, imported from India, was less severely affected than the local variety. Virus leaf curl of tomatoes [cf. ibid., 23, p. 165; 30, p. 348] was widespread in some gardens. At Yambio (Equatoria) the problem of periodicity in tung (*Aleurites* sp.), possibly associated with cankers due to *Thyronectria pseudotrichia*, is serious because the heteroperiodic trees undergo leaf shedding during the rainy season and are smaller and yield less than the orthoperiodic trees, which are in leaf throughout the year.

Although white flies [*Bemisia gossypiperda*] appeared to be very numerous at the Gezira Research Farm, no serious outbreak of cotton leaf curl virus [ibid., 31, p. 327]

was reported. In the Gash delta the disease was much less serious than in the year before, probably because almost all the Sakel cotton was sown late, ratoon growth was light, and the white fly population low. A few *Sida spinosa* plants showed leaf curl symptoms [cf. ibid., 31, p. 184] and the disease proved transmissible to Sakel cotton by white fly, but only with great difficulty. This, with the apparent rarity of infected *S. spinosa* plants, suggests that the weed is not an important means of carry-over of the virus. Transmission from symptomless X1730A cotton [ibid., 30, p. 158] to Sakel by white fly does not appear possible; if symptoms develop there may be limited transmission. X1730A seems to be more susceptible in November than in late September and early October. Transmission of the virus through *Bamia* seed is probably either very rare or non-existent. Inspection of the Wad Saadalla block from 1945 to 1948 revealed no hitherto undetected source of leaf-curl infection, and the seasonal carry-over here may be explained by the presence of infected ratoons.

In experimental work on the disinfection of cotton seed against blackarm (*X. malvacearum*) [ibid., 31, p. 184] powders containing 11·2 or 8·4 per cent. mercury were more effective than one containing 7 per cent., and all were more effective than ordinary commercial abavit B (5·6 per cent. mercury) [ibid., 30, p. 158]. The last-named is satisfactory for most of the seed to be used in Gezira, which comes from the Gash delta and generally carries little infection, but a stronger (8·4 per cent. mercury) abavit might be used where more heavily infected seed has to be sown. Dosages at the rate of 1 to 75 and 1 to 100 of commercial abavit B by weight to cotton seed were more effective than the normal 1 to 150. Commercial cotton seed does not generally hold a greater dosage than 1 to 150, excess being shaken off in transit and handling, and as the powder probably does not kill the bacteria until it has become moistened after sowing, increasing the dosage appears to be less promising than raising the mercury content. A mercury iodochloride supplied by F. W. Berk & Company appeared to be almost as effective as abavit B. Steeping in 0·2 per cent. mercuric chloride-iodide (4 in 1) is the best disinfection method known; trials indicated that an equivalent concentration of ethyl mercuric phosphate (Boots Pure Drug Company, Ltd.) might be equally effective. All the 1948–9 seed (193 sacks) for the Barakat Seed Farm was steeped in 0·2 per cent. mercuric chloride-iodide, using four household baths. The operation took six weeks and it was calculated that about 270 ml. of solution were used per lb. of seed. Three to four weeks after sowing no blackarm was seen in 46,000 holes of cotton. Evidence was obtained that flooding of the previous season's fields reduces their blackarm infectivity.

In experimental sowings the development of sorghum smut (*Sphacelotheca sorghi*) [ibid., 29, p. 163] was greatest and yields lowest following treatments which gave the poorest stands, e.g., sowing under dry conditions. The water content of the soil seemed to be more important in relation to smut development than was depth of sowing.

New records for the Sudan included *Alternaria brassicicola* on turnip and cauliflower, *Cercospora cucurbitae* on cucumber, *Phyllachora cynodontis* [cf. ibid., 29, p. 603], not before recorded for Upper Nile and Equatoria Provinces, and *Ustilago cynodontis* both on *Cynodon dactylon* [cf. ibid., 25, p. 505; 26, p. 131], *Tilletia ayresii* on *Panicum maximum*, *Tolyposporium ehrenbergii* [cf. ibid., 31, p. 320] on *Sorghum purpureo-sericeum*, *Macrophomina phaseoli* on sweet potatoes in storage [cf. ibid., 27, p. 353], *Helminthosporium bicolor* [cf. ibid., 16, p. 753; 21, p. 448] causing damping-off of young wheat, *Glomerella cingulata* on papaw [cf. ibid., 27, p. 483], and *Trametes cingulata* associated with dry rot of building timber.

[Jagoe (R. B.)]. **Notes on current investigations, October to December, 1951.**—*Malay. agric. J.*, 35, 1, pp. 36–52, 1952.

In this report [cf. *R.A.M.*, 31, p. 538] it is stated that *Rhizoctonia* [*Corticium*]

solani [ibid., 30, p. 509] and *Piricularia oryzae* [ibid., 30, p. 508], both most destructive in killing rice tillers and causing the leaf sheaths to rot, *Cercospora oryzae* [ibid., 29, p. 12], and an unidentified agaric were all found on padi plants from the Jementah Agricultural Station, Malaya.

Tea blister blight [*Exobasidium vexans*: ibid., 31, p. 517] was less harmful in the highlands than in the corresponding period in 1950, infection having been somewhat suppressed by frequent sunny mornings. The disease did not appear on the lowlands and serious damage there appears unlikely to occur.

Tomato blight (*Phytophthora infestans*) [ibid., 15, p. 632], which developed about three weeks after planting, completely destroyed a planting at the Experiment Station, despite frequent spraying.

Plant pathology and plant breeding.—*Rep. Ga Exp. Sta., 1950–51*, pp. 55–61, [?1952].

In this report [cf. *R.A.M.*, 31, p. 421] J. H. Miller states that 11,618 of the plant disease specimens so far collected have been systematically arranged and indexed in the Department.

Recent studies by G. E. Thompson have revealed that okra [*Hibiscus esculentus*] is another host of *Ascochyta* blight of cotton [*A. gossypii*: ibid., 31, p. 356].

J. G. Gaines states that tobacco blue mould [*Peronospora tabacina*: ibid., 32, p. 29], which was very severe in 1951, was controlled in beds by an all-purpose fungicide-insecticide dust composed of 10 per cent. zineb, 1 per cent. parathion, and 3 per cent. DDD. An effective spray was 12 oz. zineb, ¼ pt. 40 per cent. tetraethyl pyrophosphate (or 4 oz. 15 per cent. parathion), and 4 oz. 50 per cent. wettable DDD powder in 25 gals. water. As Granville wilt [*Pseudomonas solanacearum*: ibid., 27, p. 390; 31, p. 543] heavily infests only a few Georgia fields, resistant varieties such as Oxford 26 and Dixie Bright 27, ill-adapted to Georgia conditions, should be used only in these localities.

According to H. W. Rankin internal cork [ibid., 32, p. 33] now affects all the important sweet potato growing States, having spread principally by means of vegetative parts. Control appears to lie in the development of resistant, high-yielding varieties of commercial quality.

In spraying experiments tribasic copper gave the best control of tomato early blight [*Alternaria solani*: ibid., 30, p. 494; 31, p. 542], followed in order of effectiveness by zerlate, dithane Z78, and copper compound A. Dithane Z78 dust gave the best control of watermelon downy mildew [*Pseudoperonospora cubensis*: loc. cit.] and increased the yield, while on cantaloupe and cucumber zerlate, dithane Z78, and tribasic copper were the most effective in that order.

The use of ceresan as a seed treatment consistently increased oat stands by 20 per cent. over a three-year period while ceresan M [ibid., 31, p. 601] increased maize yields by 6 to 7 per cent. over two years.

The results of tests conducted by L. W. Boyle in 1950 indicated that the use of a mould-board plough, which cleared the cover crop or crop refuse from the top three inches of soil, and dusting for control of leaf spot [*Cercospora arachidicola* and *C. personata*] were of some value in controlling white mould of groundnuts [*Sclerotium rolfsii*]. Severe infection developed, however, after the laying of soil to control weeds.

Memoria de la primera reunión de Maní y Girasol 31 de Agosto y 1 de Septiembre de 1950 en la Estación Experimental Manfredi. [Report of the first Groundnut and Sunflower conference 31st August and 1st September, 1950, at Manfredi Experiment Station.]—163 pp., 10 figs., 2 diags., 6 graphs, 1 map, República Argentina, Ministerio de Agricultura y Ganadería de la Nación, 1950. [Mimeographed. Received September, 1952.]

The following contributions of phytopathological interest are presented in this

report. Groundnut diseases in Córdoba reviewed by T. MÁCOLA (pp. 11–13) include the root rots, caused by *Sclerotium rolfsii* [see preceding abstract], *S. bataticola* [*Macrophomina phaseoli*], and *Sclerotinia sclerotiorum*, which may cause losses up to 70 per cent. of the crop in humid seasons or on low-lying areas, while a species of *Fusarium* is responsible for considerable damage to both roots and nuts. Diseases of the aerial organs comprise the leaf spots due to *Cercospora* spp. [including *C. personata*: C.M.I. map No. 152], and 'rosette and apical necrosis', attributed to a virus [? tomato spotted wilt: *R.A.M.*, 31, p. 46]. Normally of little economic importance, the latter disease affected 25 to 30 per cent. of the crop in the region of Anisacate during 1943 and 1944. In an exploratory test to determine the effect on yields of the aerial diseases, one series of plots was sprayed nine times with a mixture of 40 per cent. ventilated sulphur, 10 per cent. BHC, 5 per cent. DDT, and 45 per cent. inert dust, while others were left untreated. The incidence of 'rosette and apical necrosis' in the sprayed plots was 1·67 per cent. and in the controls 4·93, while leaf spot intensity (judged by the number of pustules) was graded as 1 and 2·8, respectively, the yields amounting to 102,587 and 91,050 kg., respectively. In varietal reaction experiments in 1949 to 1950, the percentages of 'rosette and apical necrosis' on the coloured Córdoba groundnut, Blanco Sante Fé, Blanco Manfredi MAG, and Fla 231–51 were 15, 3, 4, and 7, respectively. The aphid vector of groundnut rosette virus in other countries, *Aphis laburni* [ibid., 19, p. 386], is present but not widespread in Argentina, where other insects may therefore be involved; the diseases are most prevalent in dry seasons when thrips and jassids abound.

On p. 127 the same author states that the sunflower virosis causing such heavy damage in other parts of the country [ibid., 30, p. 165] is less troublesome in Córdoba. In 1944 a moderately severe attack of *S. sclerotiorum* was recorded, and in 1945 one of *Albugo tragopogon* [*Cystopus tragopogonis*: ibid., 26, p. 376].

JANNONE (G.). **Studi e ricerche di entomologia agraria in Eritrea e in Etiopia. VIII. Stato fitopatologico delle colture in un' azienda agraria del territorio di Fadis (Harar, Etiopia) con particolare riguardo a un' infestazione affidica del 'Suff' (Carthamus tinctorius).** [Studies and researches in agricultural entomology in Eritrea and Abyssinia. VIII. The phytopathological condition of the crops on an agricultural estate in the territory of Fadis (Harar, Abyssinia) with special reference to an aphid infestation of 'Suff' (*Carthamus tinctorius*).]—*Riv. Agric. subtrop.*, 46, 4–6, pp. 132–137, 1952. [English summary.]

Observations in 1940 on an estate near Harar, Abyssinia, showed that only very few leaves of safflower plants had incipient infection by a rust [?] *Melampsorella ricini*. This fungus was also present on castor [*Ricinus communis*: cf. *R.A.M.*, 4, p. 590; 19, p. 330; 30, p. 196], but infection was not serious.

HAVAS (L. J.) & HEUSNER (A.). **Réactions tumorales et tératologiques d'une Tomate tétraploïde au Phytomonas tumefaciens Sm. et Twnsd.** [Tumoral and teratological reactions of a tetraploid Tomato to *Phytomonas tumefaciens* Sm. & Twnsd.]—*C. R. Acad. Sci., Paris*, 232, 18, pp. 1695–1696, 1951.

The authors inoculated with a culture of *Phytomonas* [*Bacterium*] *tumefaciens* 17 tetraploid and 27 diploid tomato plants of the Antiboise variety. On examination 89 days later, the total numbers of tumours on the tetraploid and diploid plants, respectively, were 140 and 175, and the numbers per plant 6·47 and 8·4. Though the tetraploid plants had a high proportion of fasciations (64 per cent.) as compared with only 0·7 in the diploids, these results are considered to point to a higher degree of resistance to crown gall in the tetraploid than in the diploid individuals [cf. *R.A.M.*, 26, p. 536].

Bisset (K. A.). **Bacteria.**—viii+123 pp., 37 figs., 1 graph, Edinburgh, E. & S. Livingstone Ltd, 1952. 20*s*.

In this book the author, assisted by F. W. Moore, aims at presenting a natural history of bacteria, correlating regularly occurring morphological, biochemical, and ecological characters of systematic value in such a manner as to provide a reasonably full, elementary account of the members of the groups. Autotrophs, saprophytes, and pathogens are treated alike and in perspective. The work is intended to be of use to students of microbiology and to research workers in industry, medicine, and biochemistry. There is a bibliography of 50 titles.

Pichler (F.). **Zur Methodik der Beizmittelprüfung auf Keimschädigung.** [On the procedure for testing fungicides for damage to the germling.]—*PflSchBer.*, 8, 7–8, pp. 118–123, 1 fig., 1952. [English summary.]

Details are given of the adaptation of Schmidt's 'root picture' method, for which the length attained by the roots a few days (mostly two to three) after treatment is used as a criterion [*R.A.M.*, 30, p. 116], to the assay of fungicides for toxicity to cereal seed [ibid., 4, p. 493]. Rye is generally the least and oats the most sensitive to injury from this source.

Guyot (L.) & Massenot (M.). **Dix ans d'expérimentation (1941–1950) sur la rouille noire des céréales.** [Ten years of experimentation (1941–1950) on black rust of cereals.]—*C. R. Acad. Agric. Fr.*, 38, 2, pp. 86–92, 1952.

The results of studies pursued by the Botanical Laboratory of the National School of Agriculture, Grignon, from 1941 to 1950 on the progress of cereal black rust (*Puccinia graminis*) in France [*R.A.M.*, 31, p. 234] are summarized. Altogether 248 isolates of the *P. graminis* group from various hosts were studied. Only *P. g.* f. sp. *secalis* was obtained from aecidia on barberry in nature [cf. ibid., 31, p. 486]. Race 14 of *P. g. tritici* was found 22 times on wheat, four on barley, and once each on various grasses. Races 15, 17, and 21 were isolated from wheat only, five times, once, and twice, respectively. Race 14 is not very virulent, race 21 is moderately so, and races 15 and 17 are highly virulent. Serious damage was caused in 1945 (races 14 and 15), 1947 (14, 15, and 17), and 1950 (14, 15, and 21); in the remaining years only race 14 was identified and infection was insignificant or slight. In 1950 the only varieties out of 172 grown in the wheat varietal nursery which remained unaffected or showed only slight infection were *Triticum timopheevi* [cf. ibid., 28, p. 166], GN, GP, and Thatcher. The hybrids GN and GP have been developed by the Central Station for Plant Breeding, Versailles, and both include in their parentage Hohenheimer 77, K3, Martin, and Oro.

Race 14 appears to include three different biotypes, 14α (to which Hope is moderately susceptible, while Khapli and Kota are resistant), 14β (to which all three are resistant), and 14A (to which all are moderately susceptible). The index of virulence of 14β was 8·6 in 1945, 11·6 in 1946, 12 in 1947, and 24·3 in 1950. Race 15 includes two widely divergent biotypes: 15α (to which Hope is very susceptible) and 15β (Hope resistant); 15α appears on the whole to be much more virulent than 15β, attacking more or less severely GN, GP, Oro, Thatcher, and Warren, which are usually resistant to 15β. The virulence of 15α appears to have declined in recent years.

Field and greenhouse studies during ten consecutive years showed Thatcher to be resistant to black rust, and GN and GP to be highly resistant. From crosses between GN or GP and other varieties 19 progenies each of five to 20 families have been obtained which appear to be satisfactory. The most promising are GN $\times$ Dômes and (GN $\times$ Yga) $\times$ Yga. In general, these crosses display some susceptibility to yellow rust [*P. glumarum*].

MACHACEK (J. E.) & WALLACE (H. A. H.). **Relation of market grade to germination of treated or untreated seed of Wheat, Oats, and Barley.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 17, 1952.

In tests at the Dominion Laboratory of Plant Pathology, Winnipeg, treating wheat seed of six statutory or commercial grades with ceresan M [cf. *R.A.M.*, 30, p. 147; 31, p. 546] increased normal germination by 14·6 per cent., the corresponding figures for oats (seven grades) [see above, p. 119] and barley (six grades) being 14·7 and 10 per cent. In wheat the improvement was greatest in the best grade and smallest in the lowest, whereas in oats the trend was in the opposite direction, and in barley it was variable. Storing treated wheat seed for one month in sealed bottles greatly increased the percentage of seedlings showing mercury poisoning. Injury was greatest in heavy seed and least in light.

VANTERPOOL (T. C.). **The decline of browning root rot.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 19, 1952.

Browning root rot of cereals [*Pythium* spp.: *R.A.M.*, 9, p. 581; 22, p. 58; 24, p. 4] is now of minor importance in Saskatchewan. The factors that have brought about this decrease in prevalence include the forty-fold increase in the sales of phosphatic fertilizers in the last 20 years, the use of the combine [harvester], which results in much more straw being returned to the soil, and the fact that Thatcher wheat has largely replaced Marquis [cf. ibid., 19, p. 697].

HOFFMANN (W.). **Die Heidemoorkrankheit und die Wirkung des Kupfers als Spurenelement, im besonderen nach den Erkenntnissen der Staatl.Moorversuchsstation Bremen.** [The reclamation disease and the effect of copper as a trace element, with special reference to knowledge gained at the Bremen State Moorland Experiment Station.]—*Landw. Forsch.*, 4, 1, pp. 39–45, 1952.

From his own researches in Germany and a study of 22 papers on the reclamation (copper deficiency) disease of cereals and other cultivated plants, the author finds support for previous conclusions [*R.A.M.*, 18, p. 667] that the trouble may be remedied by soil amendments of copper sulphate at a dosage of 50 to 100 kg. per ha., the effects of which persist for at least eight to ten years.

POPE (W. K.). **Wheat improvement adding smut, rust resistance.**—*Idaho agric. Sci.*, 36, 3, p. 6, 1951. [Abs. in *Plant Breed. Abstr.*, 22, 1, p. 62, 1952.]

At the Idaho Agricultural Experiment Station a high degree of resistance to rust [*Puccinia graminis*: *R.A.M.*, 31, p. 277; 32, p. 71] has been incorporated in Lemhi, a soft white spring wheat, by crossing with Kenya [ibid., 31, p. 378]. Brevor and Wasatch, two wheats with resistance to several races of smut [*Ustilago tritici*: ibid., 32, p. 71], have been crossed with the soft winter wheat Golden and the hard red winter wheat Cheyenne to improve the resistance of the latter varieties.

SLYKHUIS (J. T.). **Wheat mosaic in South Dakota.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 18, 1952.

During 1950, wheat mosaic [virus: cf. *R.A.M.*, 31, pp. 12, 549] caused various degrees of damage to winter and spring wheat in 16 counties of southern and eastern South Dakota. Experimental evidence did not suggest that the virus could survive in soil, ripe straw, or seed, but it can overwinter in living wheat plants. Certain annual grasses, especially *Setaria viridis*, appear to perpetuate the disease between harvest and the emergence of volunteer and autumn-sown wheat. All wheat varieties recommended for South Dakota were susceptible to the cultures tested.

Vasudeva (R. S.) & Hingorani (M. K.). **Bacterial disease of Wheat caused by Corynebacterium tritici (Hutchinson) Bergey et al.**—*Phytopathology*, 42, 6, pp. 291–293, 2 figs., 1952.

The results of inoculation experiments on wheat at the Indian Agricultural Research Institute, New Delhi, showed that *Corynebacterium* (*Pseudomonas*) *tritici* is unable to cause its characteristic symptoms of narrow, white flecks on the upper leaf blade and a bright yellow, gummy exudate on abortive ears and the contiguous leaves in the absence of the nematode *Anguillulina tritici* [*R.A.M.*, 26, p. 446].

In infested field plots the disease was more severe in the October sowings, when the mean minimum and maximum temperatures were 62·2° and 90·2° F., respectively, in 1949–50 and 60·1° and 89·7°, respectively, in 1950–1, than in those of November, when the corresponding levels in the former year were 46·2° and 80·6°, and in the latter 47·2° and 80·2°. Flooding aggravated the virulence of the disease. Thus, in 1949–50 the percentages of infection in two normally irrigated October-sown plots were 30 and 28, and in two flooded 65 and 60, respectively, the corresponding figures for November being 11 and 7, and 18 and 12. In 1950–1, 21 and 22 per cent. of infection occurred in the two normally irrigated October-sown plots and 55 and 45 in the flooded, while the corresponding figures for November were 12 and 15, and 18 and 19.

Absolute control of the disease was effected in four plots by sedimentation of the nematode galls in salt brine (40 lb. in 25 gals. water) or flotation in water.

Kublan (A.). **Der Gersten- und Weizenflugbrand und seine Bekämpfung.** [Barley and Wheat loose smut and its control.]—*Dtsch. Landw.*, 3, 7, pp. 353–354, 3 figs., 1952.

In the eastern zone of Germany certification of élite barley and wheat seed crops is refused if there is a single plant infected by loose smut (*Ustilago nuda* and *U. tritici*, respectively) [*R.A.M.*, 21, p. 252; 31, p. 483] within 100 paces on either side, the figure for selections being five. A further reason for rejection is the presence of an infected field at a distance of less than 50 m. in the direction of the prevailing wind. Financial losses may be appreciable, a reduction of only 2 per cent., for instance, in the Saxon barley crop representing a sum of approximately DM. 300,000. In this connexion growers are urged to make use of a co-operative continuous seed treatment unit, approved by the Ministry of Agriculture, comprising a sprinkling spiral, counter-current equipment, ventilators, and radiator batteries. The entire process of sprinkling, damping, and re-drying or cooling takes about three hours and the outlay is less than half the DM. 5 to 6 required by old-fashioned methods.

Schaller (C. W.) & Wiebe (G. A.). **Sources of resistance to net blotch of Barley.**—*Agron. J.*, 44, 6, pp. 334–336, 1952.

At the University of California, Davis, 4,526 barley varieties were tested between 1948 and 1950 for their reactions to net blotch (*Pyrenophora teres*) [*P.* (or *Pleospora*) *trichostoma*: *R.A.M.*, 30, p. 515; 31, pp. 58, 89], which is widely distributed in the State. In 1948 and 1949 natural infection in test nurseries was relied upon but in 1950 the spreader rows were sprayed with a suspension of spores and mycelium from a culture of local origin. Throughout the period of the tests, a highly resistant or resistant response was maintained by 75 varieties, mostly of Manchurian origin, outstanding in this respect being Canadian Lake Shore, Tifang, Manchu, Ming, Harbin, and the hybrid Velvet 26–95. Other resistant varieties included Tivannes from Switzerland, Oldambster Winter from Holland, Feldnaer from Norway, and Sheba from Abyssinia. Only four of the commercial barleys grown in the United States and Canada were ranked as resistant, namely, Manchuria (Minn.

184), O.A.C. 21, Oderbrucker, and Peatland. This material offers a considerable measure of choice in the selection of a variety for use in breeding for net blotch resistance.

Vanterpool (T. C.) & Samborski (D. J.). **Grey speck of Oats in Saskatchewan.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 19, 1952.

Severe grey speck of oats, caused by manganese deficiency [*R.A.M.*, 31, pp. 50, 235], was found in a district west of Spalding, Saskatchewan, on poorly drained, high lime (pH 8), Yorkton loam containing 20·45 per cent. organic matter, 0·057 per cent. manganese oxide, and high carbonates. Manganese sulphate spray gave the best control, followed by manure, though cereal straw amendments gave some improvement. Good growth response resulted when ammonium phosphate was used to supplement the manganese spray. Barley was the most resistant cereal, followed by *vulgare* wheat, *durum* wheat, and then oats. Manganese deficiency of cereals is not widespread in Saskatchewan.

Fushtey (S. G.). **Studies on infection of Rye by Claviceps purpurea.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 15, 1952.

In 1950 an attempt to produce rye ergot (*Claviceps purpurea*) [cf. *R.A.M.*, 25, p. 65; 30, p. 606] on a commercial scale in north-central Alberta was unsuccessful, but a maximum estimated yield of 166 lb. per acre was obtained on adjacent plots when inoculum was applied to the open flowers with a hand sprayer in the middle of the morning on three consecutive days. Inoculations in the middle of the afternoon were not so productive of ergot, nor were single inoculations.

Pontis Videla (R. E.). **Una podredumbre del tallo del Maiz (Zea mays L.) en Venezuela causada por Pythium aphanidermatum.** [Stalk rot of Maize (*Zea mays* L.) in Venezuela caused by *Pythium aphanidermatum*.]—*Agron. trop., Maracay*, 1, 1, pp. 13–28, 2 pl., 1 graph, 1951. [English summary. Received August, 1952.]

Stalk rot of maize (variety Sicarigua) was present in the experimental field of the National Institute of Agriculture, Maracay, Venezuela, in July, 1950, causing the affected plants to fall over. In young plants up to three internodes above soil level were affected, while in older plants rot was often confined to one, and they remained green and turgid for several days. The disease has since been observed in several other localities in Venezuela. The rot appeared after eight days during which the temperature remained at about 30° C. and there were 34·4 mm. of rain.

Isolations from the rotted internodes consistently yielded *Pythium aphanidermatum* [*R.A.M.*, 31, p. 551], the first record of this fungus in Venezuela. The disease was reproduced in healthy Sicarigua plants by inoculating the third internode above the soil with disks from a three-day-old agar culture; the pathogen was re-isolated. It also proved pathogenic to seedlings of papaw, cucumber, eggplant, watermelon, tomato, and sugar beet.

Castellani (E.). **Un seccume fogliare del Coix lacryma-jobi L.** [A leaf withering of *Coix lacryma-jobi* L.]—*Riv. Agric. subtrop.*, 46, 4–6, pp. 159–165, 2 figs., 1952. [English summary.]

A leaf blotch and withering of *Coix lacryma-jobi* observed by the author in Brazil is described. The disease was caused by a fungus considered to be a *Curvularia* of the *geniculata* group [cf. *R.A.M.*, 29, p. 277] and identical with *Helminthosporium sudanense* [ibid., 6, p. 321] and *H. cymbopogi* [ibid., 26, p. 406]. The new combination *C. sudanensis* (Frag. & Cif.) E. Castel. is proposed.

Carrante (V.) & Bóttari (V.). **Miglioramento genetico del Limone e ricerca di varietà resistenti al 'mal secco'.** [Genetic improvement of the Lemon and a search for varieties resistant to 'mal secco'.]—*Ann. Sper. agr.*, N.S., 6, 2, pp. 323–346, 6 figs., 1952. [English summary.]

A full account is given of hybridization work carried out from 1943 to 1948 at the Station for Fruit and Citrus Culture, Acireale, Italy, for the production of lemon varieties resistant to 'mal secco' (*Deuterophoma tracheiphila*) [cf. *R.A.M.*, 31, pp. 63, 605]. The varieties used were the susceptible Femminello [ibid., 18, p. 245; 27, p. 469], the highly resistant Monachello [ibid., 23, p. 128], medium-resistant Quattrocchi and Continella, resistant Cardinale, slightly resistant Incappucciato, and somewhat resistant Lunario. The first two were hybridized with: (1) the Palestine sweet lime (*Citrus aurantiifolia*), which has good resistance [ibid., 25, p. 498]; (2) bergamot (*C.* [*aurantium* var.] *bergamia*) [ibid., 30, p. 465], sweet orange (*C. sinensis*), and clementine (*C. reticulata*) for good resistance; and (3) citron (*C. medica*) and *C. aurantium* var. *myrtifolia*.

The results so far obtained with natural infections show that none of the nucellar or hybrid seedlings from Monachello (female) are affected. Among the hybrid seedlings from Femminello (female) the number of infected plants is appreciably less than among those of nucellar origin, indicating that resistance in Monachello, sweet lime, and clementine is probably genetically transmitted. The work is still in progress and particular attention is to be paid to both true hybrids and nucellar plants of Monachello.

Smirnoff (W. A.). **Aperçu sur le développement de quelques cochenilles parasites des Agrumes au Maroc (suite).** [Note on the development of some coccids parasitic on Citrus in Morocco (continuation).]—*Fruits Prim. Afr. N.*, 22, 234, pp. 107–110, 5 graphs, 1952.

In this paper, a continuation of one of purely entomological interest, the author states that in Morocco multiplication of the citrus pest *Lepidosaphes beckii* is greatly retarded and reduced by fungal diseases, the most active of which is caused by *Fusarium* sp. Others are caused by *Spicaria* [*Paecilomyces*] *elegans* [cf. *R.A.M.*, 9, p. 455], *Acrostalagmus albus* [cf. ibid., 8, p. 641; 16, p. 710; 17, p. 838], *Pestalotia versicolor* [cf. ibid., 15, p. 593; 29, p. 412], and *Stemphylium ilicis* [cf. ibid., 25, p. 582]. The *Fusarium* also attacked *L. gloveri* in the region of Rabat-Salé, while in the vicinity of Agadir (Inezgane) the mortality of *L. gloveri* reached 80 to 90 per cent. in the first generation and 70 to 80 per cent. in the second, partly owing to *F.* infection.

Sporunov (F. F.) & Galiulina (Mme Z. A.). Хищные гифомицеты из почвы Туркменистана. [Predacious hyphomycetes from Turkmenistan soil.]—Микробиология [*Microbiology*], 20, 6, pp. 489–499, 2 pl., 2 figs., 1951.

In the course of four years 13 species of nematode-catching hyphomycetes [*R.A.M.*, 31, p. 283] were isolated from Turkmenistan soils and studied at the Institute of Malaria and Medical Parasitology, Ashhabad, T.S.S.R. Most of them fall morphologically and biologically into a single group, for which a new genus, *Didymozoophaga*, is made, and to which are transferred *Arthrobotrys superba* [ibid., 29, p. 7], *A. oligospora* [ibid., 29, p. 618], and *A. arthrobotryoides* [ibid., 23, p. 299].

D. oligospora var. *fusiformis* n.var. is distinguished by its spindle-shaped conidia and longer conidiophores. *D. globospora* n. sp. has hyphae 4·5 to 5·5 μ in diameter, bow-shaped or round nematode-catching loops 22 μ in diameter, conidiophores 300 to 400 μ long and 8·5 μ wide at the base narrowing to 4·5 μ at the distal end, pyriform, hyaline conidia 22 by 12 μ, and chlamydospores 13·5 μ in diameter; *D. g.* var. *microspora* n. var. differs from the species in the length of the conidiophores

(450 μ) and the size of the conidia (17·5 by 11 μ), chlamydospores (8 to 10·5 μ), and nematode-catching rings (20 μ for the inner diameter and 26 μ for the outer). *D. g.* var. *rosea* n. var., characterized by the formation of red pigment, has conidiophores 250 μ long and rings 26 (inside) and 32 (outside) μ in diameter. *D. pravicovia* n. sp., differing from *D. oligospora* in the diameter of the hyphae (3 to 5 μ) and predacious loops (23 μ) and size of the conidiophores (5·5 to 4 by 150 μ) with rose to orange coloured conidia (21 by 13 μ), produces toxins that attract and paralyse nematodes. *D. kirghizica* n. sp. has hyphae 5·5 μ and loops 20 μ in diameter, conidiophores 350 to 400 by 8 to 5 μ, oval to pyriform, hyaline conidia 24 by 12 μ, and spherical chlamydospores 16·2 μ in diameter. *D. dolioformis* n. sp. has hyphae 4 μ and loops 24 μ in diameter, conidiophores 200 to 250 by 5·5 to 4 μ, oval to pyriform, hyaline conidia 28 by 11·5 μ, and chlamydospores 8 μ in diameter. *D. oviformis* n. sp. has hyphae 5·5 μ and loops 30 μ in diameter, conidiophores 150 to 200 by 9·5 to 4 μ, conidia 30 by 15 μ, and chlamydospores 10 to 12 μ; *D. o.* var. *ramosa* n. var. is distinguished by the branching of the conidiophores, which are up to 250 μ long, the light orange colour of the conidia, the size of the chlamydospores (8 to 13 μ), and the nematode-catching rings (25 μ inner diameter, 29 μ outer) which are not completely closed. *D. spongiosa* n. sp. has hyphae 5·5 μ and loops 20 μ in diameter, conidiophores 250 to 400 by 6 to 4·5 μ, pyriform, hyaline conidia 22 by 12·5 μ, and chlamydospores 13·5 μ. *D. superba* var. *macrospora* n. var., differing from *D. superba* in its larger spores and the light orange colour of the colony, has conidiophores 150 to 250 μ long, conidia 25 by 11 μ, chlamydospores 11 μ, and nematode-catching rings of 32 μ inner and 40 μ outer diameter.

Dactylaria brochopaga [ibid., 18, p. 251], *Dactylella bembicodes* [ibid., 29, p. 618], *Nematoctonus haptocladus*, and *Acrostalagmus* sp. are also transferred to the new genus. [There are no Latin diagnoses.]

Heim (R.). **Mémoire sur l'Antennopsis, ectoparasite du Termite de Saintonge.** [Memoir on *Antennopsis*, an ectoparasite of the Saintonge Termite.]—*Bull. Soc. mycol. Fr.*, 67, 4, pp. 336–364, 4 pl. (facing p. liv), 10 figs., 1951. (Published May, 1952.)

A full account is presented of studies by the author in collaboration with H. Buchli, J. Duché, and P. Laboureur on *Antennopsis gallica* [*R.A.M.*, 30, p. 466] infecting the termite *Reticulitermes flavipes* var. *santonensis*. The fungus was fairly uncommon in the region of La Rochelle, France. When a colony of healthy insects was placed in a rearing tube from which an infected colony had been removed, care being taken not to disturb the galleries, the healthy colony showed signs of infection after two weeks. When infected termites were introduced among healthy ones direct infection resulted. Infected insects weaken, move more slowly, and moult with difficulty; those severely attacked are devoured by the others.

The fungus secretes a mucus from which *Streptomyces termitum* n. sp. was regularly isolated.

Box (H. E.) & Pontis Videla (R. E.). **Apuntes sobre el hongo entomogeno Beauveria bassiana (Mont.) Vuill., parasito de Diatraea en Venezuela.** [Notes on the entomogenous fungus *Beauveria bassiana* (Mont.) Vuill., parasitic on *Diatraea* in Venezuela.]—*Agron. trop., Maracay*, 1, 3, pp. 233–236, 1 fig., 1951. [English summary. Received August, 1952.]

Beauveria bassiana is reported for the first time from Venezuela, where it attacked various species of *Diatraea* [*R.A.M.*, 25, p. 262]. The fungus was inoculated successfully to *D. rosa* by sprinkling a spore suspension either on the larvae or on the fragments of [sugar-] cane with which they were kept. Suspensions containing 5 and 30 mg. spores to 40 ml. water, prepared from a 21-day-old culture

on Sabouraud's agar, were sprinkled on cane fragments in flasks to which 40 *D. canella* larvae were introduced after three hours. The numbers killed at each concentration after ten days were 23 and 19, respectively. Of 80 larvae of the maize bud worm (*Laphygma frugiperda*) sprinkled with a 30 mg. concentration of *B. bassiana* only four were attacked.

The geographical and epidemiological distribution for Venezuela up to the present are given; it is suggested that there are different biological races of the fungus.

Chatterjee (H.) & Pal (K. B.). **Rotproofing Jute textiles.**—*Text. Mfr, Manchr*, 78, 929, pp. 228–231, 1 graph, 1952.

At the Technological Research Laboratories, Indian Central Jute Committee, Calcutta, tests were made of the resistance to weathering and soil burial of samples of jute ply-yarn, impregnated with solutions of copper sulphate (50 gm. per l.), 30 gm. copper sulphate plus 50 gm. ferric alum, and the same plus 40 gm. chrome alum. Judged by loss of breaking strength copper sulphate alone afforded considerable protection against deterioration, but its efficiency was enhanced by the incorporation of iron and chromium. A measure of protection during soil burial was also conferred by the presence of batching emulsion (mineral oil) in the yarn.

Hawn (E. J.) & Vanterpool (T. C.). **The perfect stage of Rhizoctonia solani from Flax.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 16, 1952.

Studies at the Dominion Laboratory of Plant Pathology, Lethbridge, Alberta, on a fungus causing a seedling blight of flax showed that it had the accepted characters of *Rhizoctonia* [*Corticium*] *solani* [*R.A.M.*, 30, pp. 307, 361] except that the [basidial] sterigmata were three times the length of those of *Pellicularia filamentosa* [*C. solani*]. Single basidiospore lines differed in cultural characters and pathogenicity from each other and from the parent. Some single-spore cultures fruited, though preliminary matings of sterile single-spore cultures remained sterile, so that the fungus appears to be heterozygous and homothallic. The stages in the formation of the perfect state agree with those described for *Pellicularia* species [ibid., 22, p. 372]. The diploid nucleus appeared to contain 12 chromosomes.

Miles (Peggy). **An investigation into the effects of mineral deficiencies on the Easter Lily.**—*Lily Yearb.* 16 (*1953*), pp. 79–83, 2 pl., 1952.

Sand culture experiments were performed at Long Ashton Research Station to determine the effects of mineral deficiencies on the Easter lily (*Lilium longiflorum*) [*R.A.M.*, 30, p. 416]. Marked foliage symptoms developed in the first year on plants deficient in nitrogen and magnesium. The former were smaller than normal and soft in texture with smaller, pale green leaves inclined upwards at an acute angle to the weak, spindly stem. Magnesium-deficient plants developed small, necrotic patches on the lower leaves resembling hail damage, their flowers were poor in shape and texture, and many new shoots emerged before the old ones had died. Leaf tip chlorosis, followed by drying and early death of the foliage, and delayed flowering occurred in both cases. In the second year calcium-deficient plants, apparently normal in the first year, were retarded in growth, a total breakdown of the bulbs ensuing.

Beaumont (A.). **Observations on the incidence of Narcissus stripe in south-west England.**—*Daffodil Tulip Yearb.* 18 (*1953*), pp. 90–100, 1952.

This paper gives a summary of the incidence of stripe disease of *Narcissus* spp. [narcissus mosaic virus: *R.A.M.*, 30, p. 159] in the field in relation to the practical problem of its control. The percentage infection is always very low in Emperor, Henry Irving, and Spring Glory. No symptoms have been recognized in the

Poetaz group and they are rare and uncertain in the Polyanthus group. Lists are given of the varieties (classified according to the new Royal Horticultural Society system) in which mosaic has been observed and of those considered highly resistant. The latter includes 44 varieties of daffodil and narcissus.

Although roguing is probably worth while to keep the amount of mosaic to reasonable proportions, too much time and labour would be required to eliminate it altogether. Even in experimental plots continued inspection and roguing are needed to eliminate the disease.

Ames (R. W.) & Thornberry (H. H.). **Carnation mosaic virus: properties and electron microscopy.**—*Phytopathology*, 42, 6, pp. 289–291, 1 fig., 1952.

The results of *in vitro* studies at the University of Illinois, Urbana, demonstrated that the thermal inactivation time of the carnation mosaic virus [*R.A.M.*, 31, p. 491] at 63° to 68° C. is 15 minutes. The optimum hydrogen-ion concentration for infection of *Dianthus barbatus* is about pH 7. The virus in expressed sap was stable for six hours at room temperature between pH 4 and 9. The dilution end point of the virus in infectious leaf sap was 1 in 1,000 and in flower sap 1 in 500. Sufficient purification and concentration of the virus could be effected by adsorption on celite at pH 4, elution at 7·2, and differential centrifugation at 15,000 × gravity for the detection in the final sediments of spherical particles about 31mμ in diameter by electron microscopy (abs. in *Phytopathology*, 41, p. 1, 1951). Samples containing these particles, which are believed to be the virus, were infectious to *D. barbatus*.

Schmidt (Trude). **Alternaria dianthicola als Erreger einer Blütenknospenfäule in Österreich.** [*Alternaria dianthicola* as agent of a flower bud rot in Austria.]—*PflSchBer.*, 9, 1–2, pp. 1–16, 5 figs., 1 graph, 1952. [English summary.]

The species of *Alternaria* responsible for a flower bud rot of carnations, which was first observed in a Vienna nursery in 1950 and assumed an epiphytotic character in 1951, was identified on the basis of its morphology in pure culture as *A. dianthicola* [*R.A.M.*, 32, p. 80]. Other hosts of the pathogen in Austria include *Dianthus barbatus* and *D. chinensis* with its var. *heddewigii*. Buds attacked at an early stage turn pale brown and shrivel without opening, the interior being completely destroyed by the pathogen. In those infected later the calyx often bursts at the site of invasion and the petals are extruded through the fissure, but as a rule the flower develops unilaterally and the petals below the point of entry of the fungus also tend to be brown and discoloured. Very late infection does not prevent normal flowering, pale spots being visible only on the calyx. *A. dianthi* [loc. cit.] has been observed only once by the writer in Austria.

An unusual feature of the Vienna outbreaks is the restriction of the pathogen to the flower buds. In inoculation experiments, however, the stems and leaves were readily infected. Control presents considerable difficulty, since none of the fungicides which had given promising results in the laboratory, e.g., Bordeaux mixture, copper oxychloride, and pomasol, was effective out of doors.

A. (F. W.). **A virus disease of China Aster.**—*Gdnrs' Chron.*, Ser. 3, 132, 3438, p. 214, 1 fig., 1952.

During the current season a high proportion of a batch of about 100 Californian Giant China asters [*Callistephus chinensis*] raised from seed supplied by a reputable firm exhibited pronounced distortion of the blooms following an attack about two weeks after planting out by the leaf-curl aphid [*Brachycaudus helichrysi*]. After initial normal development a marked yellow mottling appeared on the leaves; the tallest plants were 28 in. high compared with 36 in. usually attained by this variety.

Most of the blooms developed only a few tufts of short, thin florets at the outside, the central ones remaining hard, quilled, and green.

Typically affected blooms, submitted to the Virology Department, Cheshunt Research Station, were stated to have chrysanthemum mosaic virus [cf. *R.A.M.*, 31, p. 491], the very high incidence and degree of infection indicating that it may have been seed-borne. This was confirmed by the fact that Ostrich Plume and single asters a few feet away also suffered aphid attack but produced normal blooms.

The mottle symptoms have already been transmitted artificially to China aster. Similar symptoms have also been recorded in *Pyrethrum roseum*, stocks of which seem to be fairly generally infected.

Nearing (G. C.). **The spraying of Rhododendrons.**—*Rhododendron Yearb.* 7 (*1953*), pp. 94–95, 1952.

For many years the author has sprayed all his rhododendron plants in the United States, including about 30 old-time hybrids, many modern hybrids, and hundreds of species, at least three times a year with Bordeaux (2–2–50) plus lead arsenate (2), and no perceptible injury has resulted, except on two or three occasions when the sun came out unexpectedly immediately after spraying. Seedlings are sprayed from the time they are four or five months old, and cuttings at least once in the propagating beds. This combined spray controls nearly all fungal diseases [cf. *R.A.M.*, 23, p. 346], especially tip blight (*Phytophthora cactorum*) [cf. ibid., 17, p. 584; 22, p. 481; 23, p. 440] and [unspecified] leaf spot diseases [cf. ibid., 12, p. 696; 21, p. 504]. The addition of about 4 lb. dry, dark chrome green pigment to the spray renders it almost invisible and may prevent leaf scorch. So general is fungicidal spraying in rhododendron nurseries in the United States that, locally, bud blast [*Pycnostysanus azaleae*: cf. ibid., 31, p. 240] attacks only neglected plantings. The 5–5–50 Bordeaux formula recommended for winter spraying is much too strong for use in the growing season.

Jensen (D. D.). **Virus diseases of Orchids.**—*Calif. Agric.*, 6, 2, pp. 7, 15–16, 10 figs., 1952.

A number of rare orchid diseases, believed to be of virus origin [*R.A.M.*, 31, p. 490], are described from California. A mosaic, ranging from small spots (some appearing as yellow rings with green centres) to large mottled patches, which are smaller and more scattered on younger leaves and coarser on older ones, has been observed on leaves of *Dendrobium nobile* [see next abstract], which at the same time are covered with small necrotic spots. On *Laelia anceps* [loc. cit.] affected by the etch virus disease brown to necrotic, sunken lines and partial or complete rings with light green to pale yellow centres develop on the distal half of the leaf. In sap inoculation experiments this virus caused definite mottle symptoms in *Cymbidium* [loc. cit.] seedlings 36 days after inoculation. On *Lycaste aromatica* leaves narrow, longitudinal streaks, varying from very light to dark green, are symptoms of a mosaic disease believed to be of virus origin. Similarly, diamond spot symptoms [cf. ibid., 31, p. 329] observed on *Miltonia roezlii* in central California suggest a virus.

Another virus disease, which causes ring spot symptoms in *Odontoglossum grande* [ibid., 30, p. 610], is recorded from California only. It was transmitted successfully by sap inoculation only to *Zinnia*, of 20 different plant species tested. All sap-inoculated *O. grande* plants became infected and also one given purified virus preparation. Evidence indicates that this virus may be the same as or closely related to the viruses causing atypical mosaic symptoms in *Cymbidium* and some flower-breaking of *Cattleya* [ibid., 31, p. 490]. Mosaic symptoms (light and dark

green with stunted leaves) have also been observed on *O. grande* plants. The virus was transmitted experimentally.

A severe type of mosaic streaking characterized by conspicuous, irregular, chlorotic spots and streaks on leaves of *Oncidium rogersi* and *O. concolor* was reported from one locality in California. The virus was transmitted experimentally by sap inoculation to *Cymbidium* seedlings, the incubation period being about three months. A severe mosaic mottle similar to that of *Cymbidium* mosaic was induced. Streaks made up of a combination of spots ranging from light green to necrotic were observed on *O. flexuosum* leaves.

Another streaking ring spot disease, probably due to a virus, was detected on 20 *Stanhopea* plants believed to be of South American origin. A month or two after the growth of the new leaves, numerous yellow spots and rings appeared, sometimes forming a concentric, circular to diamond-shaped pattern. The chlorotic spots, very faint at first, were soon clearly defined. The mature leaves of a *Vanda caerulea* plant affected by the *Vanda* ring spot virus at Berkeley, California, bore a concentric pattern of yellow rings or chlorotic spots, or a band of parallel lines extending over much of the leaf, especially along and near the margin.

Murakishi (H. H.). **Transmission of a leaf mosaic associated with color break in the flowers of Dendrobium superbum Reichb. f.**—*Phytopathology*, 42, 6, pp. 339–340, 1 fig., 1952.

A leaf mosaic and floral colour break have long been observed on the Honohono orchid (*Dendrobium superbum*) throughout the territory of Hawaii. On some diseased plants the alternate short streaks of yellowish-green and green, the former between and the latter close to the veins, are accompanied by necrotic streaks [cf. preceding abstract]. The symptoms are most conspicuous on young shoots. The green parts, especially of older leaves, are thicker than the yellowish-green, causing undulation and distortion. The leaves and stems are stunted.

Transmission tests were performed by inarch grafting and sap inoculation, resulting in the development of mosaic symptoms only on the new leaf growth and lateral shoots produced after the operation; the average incubation periods by the two procedures were 30 to 45 and 30 to 33 days, respectively.

The leaf mosaic of *D. nobile* in Brazil [*R.A.M.*, 26, p. 491] differs in being transmissible to tobacco and *Nicotiana rustica*, which appear to be resistant to the Hawaiian virus, and no colour-break symptoms were associated with the former.

Ark (P. A.), Starr (M. P.), & Sutton (D. D.). **Bacterial chalk rot of yellow and pink Callas.**—*Phytopathology*, 42, 6, pp. 320–322, 1952.

It appears from cultural and taxonomic studies that the organism responsible for chalk rot, a destructive disease of *Zantedeschia elliottiana* and *Z. rehmanni*, which are cultivated on a commercial scale in Santa Cruz county, California, is identical with *Erwinia carotovora*, already reported by Ark and Tompkins as the agent of a soft rot of the former host (*Plant Dis. Reptr*, 30, p. 42, 1946). *Z. aethiopica* [cf. *R.A.M.*, 31, p. 17], *Z. albomaculata*, *Z. melanoleuca*, and *Z. pentlandi* showed a high degree of susceptibility in inoculation experiments with chalk rot isolates. The authors agree with Dowson [ibid., 29, p. 252] that *E. aroideae* is merely a strain of *E. carotovora* [ibid., 31, p. 55]. The disease is most severe under conditions of high temperature and soil moisture. Chemical treatments of the corms failed to control chalk rot, but soil amendments with cow manure at the rate of 8 tons per acre reduced the incidence of infection from 55 to 5 per cent.

Yamane (G.). **Über die Entfaltungsbewegung und die Entstehung der Blattmosaik von Fatsia japonica.** [On the unfolding movement and the development of leaf

mosaic in *Fatsia japonica*.]—*Sci. Rep. Kagoshima Univ.* 1, pp. 59–69, 11 figs., 1952. [Japanese, with German summary on p. 64.]

The development of leaf mosaic on *Fatsia japonica* is fully described in relation to the unfolding leaf and the hyponastic and epinastic movements of the petiole and blade, as observed at the University of Kagoshima, Satsuma, Japan.

Fischer (G. W.) & Meiners (J. P.). **Comparative value of several fungicides in the control of head and stripe smuts in certain forage grasses.**—*Bull. Wash. St. agric. Exp. Sta.* 532, 18 pp., 1 diag., 1952.

In seed-treatment experiments conducted during 1939 to 1940 and 1941 to 1942 for the control of head smut (*Ustilago bullata*) [*R.A.M.*, 31, p. 493; 32, p. 22] and stripe smut (*U. striiformis*) [ibid., 31, p. 330] on various fodder grasses, soaking seed of slender wheat grass (*Agropyron trachycaulum*) and Canada wild-rye (*Elymus canadensis*) for an hour or more in 1 in 300 formaldehyde (both can withstand up to four hours without injury) controlled head smut entirely. The disease was equally well controlled by organic mercury dusts, such as new improved ceresan and 2 per cent. ceresan, though overdosage resulted in seed injury and reduced stands, and by the non-phytotoxic arasan, arasan S.F., and tersan dusts, the last two plus a wetting agent. Fermate gave almost 100 per cent. control and 200 per cent. improvement in stands (over the untreated), while dow 9A, puratized, dowicide 2, and phygon gave complete control and some improvement in stands, even at maximum dosage and six weeks' storage before seeding. Seed of *A. trachycaulum*, *E. canadensis*, and mountain brome (*Bromus marginatus*) can apparently be stored at least eight weeks after treatment, even with volatile mercurials, without effect on the degree of control or viability.

Stripe smut, though more vulnerable to seed treatment fungicides, was best controlled by semesan, spergon, and copper carbonate.

Vaughn (J. R.) & Klomparens (W.). **Drugs on the green.**—*Golf Course Reptr* (formerly *Greenkeep. Reptr*), 20, 2, pp. 5–7, 1 diag., 1952.

The information in this paper on the control of fungous diseases, including dollar spot [*Sclerotinia homoeocarpa*] and melting-out (*Helminthosporium* [*vagans*]), of Seaside bent grass [*Agrostis palustris*] by actidione at East Lansing, Michigan, has already been noticed from another source [*R.A.M.*, 31, p. 331].

Wilson (C. G.) & Grau (F. V.). **1951 national co-operative turf fungicide trials.**—*Golf Course Reptr* (formerly *Greenkeep. Reptr*), 20, 2, pp. 8–13, 1952.

The results of the co-operative turf fungicide trials undertaken in 1951 in California, Iowa, Michigan, Rhode Island, and Pennsylvania revealed the same general trends as in 1950 in respect of the most effective treatments for specific diseases. On this basis the cadmium compounds (cadminate, crag 531, and puraturf 177) and calo-clor are recommended for the control of dollar spot [*Sclerotinia homoeocarpa*: see preceding abstract], calo-clor and tersan-calo-clor (1 oz. each per 1,000 sq. ft.) against brown patch [*Corticium solani*: *R.A.M.*, 32, p. 82], and the cadmium compounds and calo-clor against copper spot [*Gloeocercospora sorghi*] and snow mould [*Calonectria nivalis*: ibid., 31, p. 330], respectively.

The best control of leaf blotch (*Helminthosporium cynodontis*) on Bermuda grass [*Cynodon dactylon*: loc. cit.] in a preliminary test at the Georgia Coastal Plain Experiment Station was achieved by the use of special semesan at the rate of $2\frac{2}{3}$ oz. in 10 gals. water per 1,000 sq. ft. Directions are also given for the supply of nitrogen and other management practices.

Piper Sudan Grass.—*Seed World*, 71, 8, p. 43, 2 figs., 1952.

Piper Sudan grass (Wisconsin No. 797), a new variety resistant to leaf blight (*Helminthosporium turcicum*) [*R.A.M.*, 29, p. 361] and anthracnose (*Colletotrichum graminicola*) [ibid., 32, p. 76], was developed at the Wisconsin Agricultural Experiment Station in 1942 as a result of a double cross between selections from lines imported from Texas and Kansas Experiment Stations and Tift Sudan grass, developed by the Division of Forage Crops and Diseases and the Georgia Experiment Station. Yields of Piper have been equal and mostly superior to those of other varieties when grown in the northern United States. This variety is also well adapted to the central and western States.

Langdon (R. F. N.). **The geographic distribution of Claviceps pusilla.**—*Aust. J. Sci.*, 14, 5, pp. 164–165, 1952.

Material of *Themeda cymbaria* infected by *Claviceps* was collected by T. S. Ramakrishnan at Kodaikanal in southern India in December, 1949, and sent to the author in England early in 1950. Sclerotia placed on moist sand in a covered dish in April gave rise during June to perithecial stromata of *C. pusilla* [*R.A.M.*, 29, p. 566].

Böhl (K.). **Die Ursachen der Kalkempfindlichkeit der gelben Lupine und ihre Bedeutung für die Praxis.** [The causes of the sensitivity to lime of the yellow Lupin and its importance in practice.]—*Dtsch. Landw.*, 3, 7, pp. 374–376, 1952.

The etiology of lime-induced chlorosis of the yellow lupin is discussed in the light of 11 German contributions to the subject [cf. *R.A.M.*, 24, p. 19; 31, p. 558].

Malaguti (G.). **Una podredumbre del tallo de Crotalaria juncea, causada por Ceratostomella fimbriata.** [Stem rot of *Crotalaria juncea* caused by *Ceratostomella fimbriata*.]—*Agron. trop., Maracay*, 1, 4, pp. 287–292, 2 figs., 1952. [English summary.]

In August, 1950, *Crotalaria juncea* growing in various parts of the States of Aragua and Carabobo, Venezuela, wilted at the tips, the leaves also withering while still erect. In 1951 young plants, those in flower in winter sowings, and many after rainfall developed similar symptoms. In some parts about 30 to 40 per cent. of the plants were affected. The pathogen, *Ceratocystis fimbriata* [C.M.I. map No. 91; cf. *R.A.M.*, 27, p. 185], the first record of this fungus on *Crotalaria juncea* in Venezuela, was isolated from the margins of necrotic lesions and from the medulla. Pathogenicity was established by inoculating *C. juncea* just below soil level with a fragment of a 15-day-old culture and covering it with a piece of damp cotton, by mixing cultures with sterilized soil before sowing, and by sprinkling seedlings given minute stem pricks with an aqueous spore suspension. Each method gave a high proportion of affected plants from which the pathogen was reisolated. Of the three isolates used, from *C. juncea*, coffee, and sweet potato [ibid., 31, p. 101], the first two were equally virulent but the third less so. The *Crotalaria* isolate was moderately pathogenic to sweet potato.

Gorlenko (M. V.) & D'Yakova (Mme G. A.). Бактериальные болезни плодовых деревьев в СССР. [Bacterial diseases of fruit trees in the U.S.S.R.]—Микробиология [*Microbiology*], 20, 6, pp. 534–540, 1951.

The literature on bacterial diseases of fruit trees in the U.S.S.R. is briefly reviewed. *Bacterium* [*Xanthomonas*] *cerasi* [*R.A.M.*, 18, p. 378] and *B.* [*X.*] *pruni* [ibid., 20, p. 372] on stone fruits, *B. armeniaca* on apricots and peaches [ibid., 31, p. 621], and *B. tumefaciens* [ibid., 19, p. 73] on all fruit trees are the only diseases

so far recognized and the authors propose a detailed course of study to be carried out in the near future.

Tihonov (N. N.). **Laletino, a valuable Reinette variety.**—*Sad i Ogorod* (*Orchard and Garden*), *1951*, 6, pp. 71–72, 1951. [Russian. Abs. in *Plant Breed. Abstr.*, 22, 1, p. 125, 1952.]

Laletino, bred at the Krasnojarsk Fruit Research Station, U.S.S.R., is a hardy, early-bearing, productive reinette [apple] showing resistance to scab [*Venturia inaequalis*: *R.A.M.*, 20, p. 545].

New diseases attack fruit. Spread of 'Henderson spot'.—*Fruit and Prod.*, 5, 11, pp. 7–8, 1951. [Abs. in *Hort. Abstr.*, 21, 4, p. 476, 1951.]

A suspected virus disease of apples, Henderson spot or thumbmark, is reported from the Hawke's Bay district, New Zealand, on Granny Smith and Delicious varieties. The disease affects the fruit only, producing brown, concentric markings similar to thumb prints.

Issa (E.). **O 'oídio' da Macieira.** [Apple 'oidium'.]—*Biológico*, 18, 5, pp. 83–84, 1 fig., 1952.

In connexion with the introduction of apple powdery mildew (*Podosphaera leucotricha*) into São Paulo, Brazil [C.M.I. map No. 118], on planting material from Argentina, the author observes that in one district in 1951 the disease appeared in patches on some of the fruits. In the same region pears [cf. *R.A.M.*, 30, p. 327] and quinces [cf. ibid., 28, p. 338] were also attacked. Treatment by plant sanitation and the application of sulphur fungicides is recommended. White Pearmain and Winesap apples are said to be comparatively resistant.

Mulder (D.). **Nutritional studies on fruit trees. II. The relation between potassium, magnesium and phosphorus in Apple leaves.**—*Plant & Soil*, 4, 2, pp. 107–117, 3 graphs, 1952.

In further studies at the Phytopathological Research Institute, Wageningen, Holland, a high potassium content was found to be associated with a low phosphorus content of apple leaves, a result of significance in relation to bitter pit [*R.A.M.*, 31, p. 287]. A positive correlation between the magnesium and phosphorus contents was deduced from analyses by a colorimetric method and total determinations, indicating that the former element is largely concerned in the uptake of the latter. Hence it is suggested that in cases of severe bitter pit it may be more economical to apply magnesium rather than phosphate fertilizers to increase the phosphorus content of the leaves in magnesium-deficient marine loam soils.

Jones (J. O.) & Dermott (W.). **Copper deficiency in Pears.**—*J. Minist. Agric.*, 59, 1, pp. 35–37, 2 pl. (facing p. 25), 1952.

The severe copper deficiency of nursery pears in north-west Surrey reported in 1948 [*R.A.M.*, 29, p. 264], to which Beurré Hardy, Conference, Marguerite Marrillat, Josephine de Malines, and Durondeau showed a slight degree of resistance, was controlled effectively in 1949 by spraying in May with 0·1 per cent. copper sulphate, and again in 1950 when 0·075 per cent. was used. Winter sprays were less effective. The various treatments were repeated the following season; the percentages of untreated trees free from the deficiency in September 1950 and 1951 were 0 and 3, respectively, whereas the corresponding figures for those receiving a 0·075 per cent. spray in May were 99 and 100. The copper contents of the leaves of untreated and treated trees were 1 and 6·5 p.p.m., respectively.

Torikata (H.) & Komai (Y.). **Studies on the resistance of Japanese Pear to the black spot disease fungus (Alternaria kikuchiana Tanaka). III. On the polyphenol oxidase in the fungus-free filtrate of culture media.**—*Ann. phytopath. Soc. Japan*, 16, pp. 63–68, 1952. [Japanese, with English summary.]

The laccase (polyphenol oxidase) reaction was detected in the fungus-free filtrate of a potato decoction culture of the pear black spot fungus (*Alternaria kikuchiana*) [*R.A.M.*, 29, p. 625], but tyrosinase was not present. Oxidase activity and growth rate of the mycelium reached a climax after 12 to 14 days in culture and was negligible after a month. Dialysis of the culture filtrate through a collodion membrane showed that the enzyme solution retained in the dialyser does not cause the death of the leaf tissue, but blackening is induced by the dialysate. A positive polyphenol oxidase reaction also developed in culture solutions of some other species of *Alternaria*, most of which, however, were innocuous to pear leaves. Presumably, therefore, the polyphenol oxidase produced by *A. kikuchiana* is not directly responsible for the death of pear leaves and fruits, though it may be concerned in the development of the lesions.

Volkova (Mme E. P.). **The Peach variety Sejanec Volkovoĭ.**—*Sad i Ogorod* (*Orchard and Garden*), *1951*, 8, p. 76, 1951. [Russian. Abs. in *Plant Breed. Abstr.*, 22, 1, p. 129, 1952.]

The late peach Sejanec Volkovoĭ (Volkova's Seedling), a seedling of Salway obtained at Soči, U.S.S.R., shows resistance to leaf curl [*Taphrina deformans*: *R.A.M.*, 31, p. 497] and produces fruit with good keeping qualities.

Wenzl (H.). **Sclerotinia-Spitzendürre bei der Zwergweichsel (Prunus fruticosa Pall.).** [Tip-withering of Dwarf Cherry (*Prunus fruticosa* Pall.) by *Sclerotinia*]. —*Sydowia*, 6, 1–4, pp. 288–289, 1952.

Following excessively heavy precipitation in north-eastern Austria in May, 1951, blossom blight of cherry and apricot (*Sclerotinia laxa*) [*R.A.M.*, 30, p. 616; 31, p. 536] was accompanied by a remarkable withering of the shoot tips, which also destroyed nearly all the blossom-bearing shoots 10 to 30 cm. in length in a stand of dwarf cherry. Both the apricots and cherries were situated at an altitude near the limit of their distribution, and the unfavourable environmental conditions may well have contributed to the severity of the attack.

Grosjean (J.). **Natuurlijke herstel van loodglansziekte.** [Natural recovery from silver leaf disease.]—*Tijdschr. PlZiekt.*, 58, 4, pp. 109–120, 1 graph, 1952. [English summary.]

Annual records from 1944 to 1950, inclusive, of the number of Victoria plum trees recovering from silver leaf (*Stereum purpureum*) [cf. *R.A.M.*, 14, p. 772] in orchards of the Betuwe, Holland [ibid., 28, p. 631; 31, p. 390], showed that they were most numerous in 1945 and 1947, when there was a much more abrupt spring change from winter to summer temperatures than in the other years covered by the investigation. In the same two years, moreover, the percentages of reinfection (1·8 and 1·4, respectively) were the lowest of the period. The process of recovery was significantly assisted by the application of oxyquinoline sulphate to the trees by the bore-hole method already described [ibid., 31, p. 287].

The temporary resistance to infection by *S. purpureum* acquired by plum trees during the summer is tentatively attributed to the presence in the leaves of inhibitory substances produced in the course of photosynthesis, which is accelerated by a combination of strong light and high temperatures. This form of resistance might last until the stored products of assimilation are transported to the buds at the end of the winter. Pruning methods aimed at the admission of light to all parts of the

tree should prove helpful in silver leaf control. The (unpublished) results of experiments by Vlag *et al.* lent no support to the theory of Brenchley and Brooks that the spread of the fungus is impeded by the formation of gum barriers [ibid., 11, p. 59].

Willison (R. S.) & Berkeley (G. H.). **An experiment in cross protection with some stone fruit viruses.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 20, 1952.

In studies at the Dominion Laboratory of Plant Pathology, St. Catherines, Ontario, pairs of year-old Montmorency cherry trees inoculated in March, 1949, with one of the following viruses: cherry yellows [*R.A.M.*, 31, p. 50], prune [plum] dwarf [loc. cit.], tatter leaf [ibid., 30, p. 616], and [cherry] necrotic ring spot [loc. cit.; ibid., 31, p. 129], were re-inoculated in March, 1950, with another virus or strain. Like the first, the second virus in each case, with one possible exception, also induced shock symptoms, which were sometimes less severe than when healthy plants were infected. Under the experimental conditions cross protection by one virus against another appears to have been incomplete or lacking; the distribution of shock symptoms over the trees indicated that in sour cherry these viruses spread rapidly throughout newly infected trees.

The shock symptoms produced by either of two strains of necrotic ring spot in trees already infected with tatter leaf differed from those occurring when the order of infection was reversed or when either strain was used on healthy trees.

Cornuet (P.). **Sur l'extraction et l'inoculation par voie mécanique de certains virus affectant les Fraisiers.** [On the extraction and inoculation by mechanical means of certain viruses affecting Strawberries.]—*C. R. Acad. Sci., Paris*, 235, 3, pp. 271–273, 1952.

Proceeding on the hypothesis that the difficulty of extracting the infective principle from virus-diseased strawberry leaves is due, as in the case of dahlia mosaic virus, to the liberation of tannins in the sap [*R.A.M.*, 31, p. 121], the author eliminated these substances by the extraction of samples of strawberry and *Fragaria vesca* leaves in France [ibid., 30, p. 174] with ethyl alcohol after lyophilization [ibid., 32, p. 15] to prevent dehydration of the virus. The crude solution remaining after centrifugation was inoculated by rubbing with carborundum into healthy *F. vesca* plants, two to four of which out of every five developed symptoms resembling those of Prentice's virus 1 [mild crinkle virus: ibid., 27, p. 571; 28, p. 342] in the course of three weeks. There was no difference in respect of virulence or symptomatology between the extracts from strawberry and those from *F. vesca*. The spectrophotometric analysis of precipitates of the virus revealed the presence of nucleic acids which were absent from healthy plant extracts.

Control of Panama disease.—*Agric. Chemic.*, 7, 4, p. 93, 1952.

It is claimed by the Tela Railway Company, a Honduran affiliate of the United Fruit Company, that Panama disease of bananas [*Fusarium oxysporum* var. *cubense*: *R.A.M.*, 31, p. 131] may be controlled by flooding the infected land and sealing off the soil. Flooding for one to three years is reported to rid the soil of the fungus.

California Avocado Society Yearbook, *1950*, 224 pp., [?1950. Abs. in *Plant Breed. Abstr.*, 22, 1, pp. 132–133, 1952.]

In the section by H. Griswold (pp. 28–30), comprising the report of the committee on foreign explorations, it is stated that the wild *Persea floccosa* from Aquila, Mexico, has shown resistance to avocado root rot (*Phytophthora cinnamomi*) [*R.A.M.*, 27, p. 483; 31, p. 338] in California.

Frear (D. E. H.). **Pesticide handbook.**—176 pp., Pennsylvania State College, College Science Publishers, 1952. $1.25.

This handbook, the fourth edition [*R.A.M.*, 30, p. 480], has been completely revised and brought up to date as far as possible. Over 4,400 trade-named pesticides are listed; animal repellents and a new section on properties, compatibilities, and hazards of the common pesticides have been added.

Martin (J. T.). **Problems arising from the use of chemicals in food.**—*Chem. & Ind. (Rev.)*, *1952*, 16, pp. 345–350, 1952.

From a consideration of the available information on the use of persistent chemicals for the insecticidal and fungicidal treatment of edible crops, the risk of noxious residues appears to be slight provided normal precautions are observed. More data, however, are necessary for an assessment of the true position [cf. *R.A.M.*, 31, p. 392].

McNew (G. L.). **The fundamentals behind fungicide research.**—*Agric. Chemic.*, 7, 4, pp. 54–56, 143, 145, 147, 149, 151–153, 154, 2 figs., 2 diags., 1952.

In this paper, based on a talk given before the 13th Annual New York State Insecticide-Fungicide Conference of Cornell University at Ithaca, New York, on 18th November, 1951, the author indicates, with reference to the literature (25 titles), the very great benefits derived from applying fundamental knowledge wisely to practical research programmes. The problems associated with the search for new fungicides are discussed from the aspects of the search for active nuclei among the organic compounds, improving the basic nucleus, and the need for fundamental information concerning the mechanism of spore penetration and the type of cell metabolites or enzymes inactivated.

Specialpræparater til bekæmpelse af plantesygdomme og skadedyr anerkendte af Statens Forsøgsvirksomhed. Gyldig for året 1952. [Special preparations for the control of plant diseases and pests approved by the State Experimental Service. Valid for the year 1952.]—*Tidsskr. Planteavl*, 55, 3, pp. 511–529, 1952.

Analyses are furnished of the plant-protectives approved by the Danish State Experimental Service for use in 1952 [cf. *R.A.M.*, 31, p. 343].

Janke (A.) & Beran (F.). **Über die Einwirkung von Schwermetallsalzen auf Pilze. Beitrag zur Kenntnis der Wirkungsweise von Schwermetall-Mikrobiziden. I. Die Bedeutung der Thiol-Verbindungen für die lebende Zelle und deren Beeinflussung durch keimschädigende Mittel.** [On the effect of heavy metal salts on fungi. Contribution to the information on the mode of action of heavy metal microbicides. I. The importance of thiol compounds to the living cell and the influence of germicides thereon.]—*PflSchBer.*, 8, 11–12, pp. 161–178, 1952. [English summary.]

In studies at the Federal Plant Protection Institute, Vienna, directed towards a clarification of the toxic mechanism of the heavy metal compounds (particularly mercury) widely used as fungicides, special attention was paid to the possibility of their reaction with the thiol group, represented in the living cell by cysteine [*R.A.M.*, 27, p. 484], homocysteine, glutathione, and the so-called thiol proteins, i.e., proteins having polypeptide chains with 'fixed' thiol groups. Heavy metals may react in two ways with thiol compounds of this kind, either through a catalytic action on the autoxidation of the thiol groups by atmospheric oxygen, involving the formation of hydrogen peroxide, or by combining with the thiol groups to produce mercaptides. Such reactions disturb the metabolism of the proteins. However, a

blocking of thiol groups by heavy metals also inhibits action of enzymes, the structure of which contains thiol groups.

From a survey of contributions to the literature (listed in a seven-page bibliography) it appears that the microbicidal effect of heavy metal compounds (notably on bacteria) can be reduced by cysteine, glutathione [ibid., 30, p. 571], and similar thiol products. On the other hand, an enhancement of the fungistatic effects of heavy metals by thiol compounds has also been reported.

Zeumer (H.). **Kombinationsmöglichkeiten von Pflanzenschutzmitteln.** [Possibilities of combining plant-protectives.]—*NachrBl. dtsch. PflSchDienst (Braunschweig), Stuttgart*, 4, 6, pp. 90–94, 2 diags., 1952.

The principles governing the compatibility or otherwise of some standard fungicides and insecticides are explained, and the results of tests on their combination for the joint control of plant diseases and pests at the Brunswick branch of the German Biological Institute are described and portrayed diagrammatically.

Keyworth (W. G.) & Dimond (A. E.). **Root injury as a factor in the assessment of chemotherapeutants.**—*Phytopathology*, 42, 6, pp. 311–315, 1952.

This is a full account of an investigation of the procedure for *Fusarium* wilt assay of chemotherapeutants used at the Connecticut Agricultural Experiment Station (abs. in *Phytopathology*, 40, p. 4, 1950), which consists in the application of the test compounds to tomato roots over a period of ten days before inoculation with a bud-cell suspension of *F.* [*bulbigenum* var.] *lycopersici*. An abstract has already appeared [*R.A.M.*, 31, p. 581].

Brook (M.). **Differences in the biological activity of 2 : 3 : 5 : 6-tetrachloronitrobenzene and its isomers.**—*Nature, Lond.*, 170, 4337, p. 1022, 1952.

In experiments in the Research Department, Boots Pure Drug Co., Ltd., Nottingham, 2:3:4:5-tetrachloronitrobenzene [*R.A.M.*, 30, p. 385] inhibited radial growth of normal strains of *Fusarium caeruleum* [ibid., 31, p. 625] more than the 2:3:5:6 isomer. Two of the mutant strains previously shown to be resistant to the latter were less resistant to the former isomer. Both strains retained their resistance after five months' growth without the fungicide. The 2:3:5:6 isomer was a more powerful inhibitor of potato sprouting than the 2:3:4:5 (both applied as 2 per cent. dust), while the reverse was true of the growth of lettuce treated with 5 per cent. dust. Preliminary field tests indicated that the latter isomer was less effective than the former in controlling *Botrytis cinerea* on lettuce [ibid., 28, p. 109; 31, p. 270].

Lopatecki (L. E.) & Newton (W.). **The chelates and their metal combinations as fungicides.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, p. 17, 1952.

In work on fungicides at the Dominion Laboratory of Plant Pathology, Saanichton, British Columbia [cf. *R.A.M.*, 31, p. 51] the evolution of hydrogen sulphide from nabam [ibid., 31, p. 193] in the presence of acid was ascertained to account in part for the fungicidal effect of the material. Under the same conditions hydrogen sulphide was not evolved from ferbam or ziram [loc. cit.], which decomposed to produce carbon disulphide gas and dimethylamine.

Höhener (H.). **Zwei Jahre praktischer Erfahrungen in der Anwendung des Helikopters bei der chemischen Schädlingsbekämpfung in der Schweiz.** [Two years of practical experience in the use of a helicopter for chemical pest control in Switzerland.]—*Schweiz. landw. Mh.*, 30, 5, pp. 165–179, 5 figs., 1 diag., 1 graph, 1952.

This is a detailed survey of the technique, organization, and economics of the

use of the Hiller 360 helicopter (Fr. 130,000, Firma Air Import, Kriens-Lucerne) for spraying [cf. *R.A.M.*, 31, p. 393] for the control of pests, potato blight (*Phytophthora* [*infestans*: see below, p. 147]), and *Cercospora betae* on beet in Switzerland [ibid., 31, p. 364] in 1950 and 1951.

Both diseases were practically eliminated by the use of cupromaag at an average dosage of 6·7 kg. per ha., equivalent to 75 l. of spray mixture at a concentration of 9±2 [? 9·2] per cent., for potato and 7·1 kg. (88 l., 8·2 per cent.) for beet. The average duration of the helicopter treatment is 7·5 minutes as compared with 76 for a motor sprayer with a special nozzle 0·7 mm. in diameter, 120 to 170 for the same with an ordinary nozzle, and 85 for a mist blower. The coverage of the four machines is 8·4, 0·8, 0·4 to 0·5, and 0·7 ha. per hour, respectively, and the costs for the helicopter, motor sprayer with ordinary nozzle, and mist blower Fr. 31·45, 25 to 48, and 34·25 per ha., respectively. A remarkable feature of the helicopter applications was the extreme tenacity of the highly concentrated copper deposit (exceeding that of the motor sprayer and mist blower by 20 and two to three times, respectively).

Bowen (H. D.), Hebblethwaite (P.), & Carleton (W. M.). **Application of electrostatic charging to the deposition of insecticides and fungicides on plant surfaces.**—*Agric. Enging, St Joseph, Mich.*, 33, 6, pp. 347–350, 2 figs., 2 diags., 1 graph, 1952.

A full description is given of the construction and application in laboratory and field tests of an electrostatic duster [*R.A.M.*, 27, p. 287], the use of which appears from experiments to date at Michigan State College, East Lansing, to result in a considerable saving (at least half) in the quantity of an insecticidal or fungicidal dust required to confer protection on a given crop, as well as in a more thorough and uniform coverage of plant surfaces. Subsidiary to these two main advantages are several others, including the elimination of night dusting and reduced interference by wind. A simplified theory of the attraction of charged dust to a growing plant is presented in terms of elementary physics [loc. cit.].

Caffrey (M.). **The problem of plant disease.**—*Search*, *1952*, 4, pp. 18–21, 1952.

In this paper, read at a conference on plant protection held in Dublin on 6th May, 1952, the author discusses the importance of disease control, biologic forms of fungal disease pathogens with special reference to wheat stem rust (*Puccinia graminis*), and the breeding of disease-resistant varieties of crop plants. He states that the F.A.O. have made and are to maintain world collections of varieties and strains of farm crops with desirable germ-plasm, so that there may be ample material for all plant breeding programmes. The world's entire resources of genetic plant material are now available for the production of resistant crop varieties. In Ireland *P. graminis* [*R.A.M.*, 6, p. 277] is not a serious menace to wheat as it does not usually appear until most of the wheat is ripening. If, however, the spores should reach the country a fortnight earlier, the whole Irish wheat crop would be threatened, as all the varieties grown are susceptible.

Bawden (F. C.). **Growing healthier crops.**—Reprinted from 'Four thousand million mouths', Oxford University Press, pp. 74–92, 1951.

In this article (chapter 5 of the original work), dealing with various methods of obtaining healthier crops to increase food supplies, the need for more plant pathologists is emphasized and it is strongly urged that the study of plants be given priority for monetary assistance. More speedy legislation, a better quarantine service, and a prevention rather than a cure policy are advocated. The advantages of planting healthy stock, growing resistant varieties, using specified rotations,

seed disinfection, soil sterilization, and protective spraying, all very important in maintaining crop hygiene to reduce many diseases, are briefly reviewed.

Study group reports on U.S.D.A. programs for insect and plant disease control.—*Agric. Chemic.*, 7, 4, pp. 51, 117, 1952.

A group investigation of the plant disease control programmes conducted by the United States Department of Agriculture [*R.A.M.*, 31, p. 226] indicated the need for continuing each current programme although some adjustments in their scope are recommended. The enforcement of adequate State laws relating to insects and plant diseases should be a prerequisite to the granting of Federal assistance wherever practicable, except where failure of one State to act would jeopardize the control programmes of co-operating States.

Thomas (Mary). **Back crossing—the theory and practice of the backcross method in the breeding of some non-cereal crops.**—*Tech. Commun. Bur. Plant Br., Cambridge*, 16, vi+136 pp., 1952. 15*s*.

Plant breeders generally are familiar with the use of the back-cross method by which a single desirable character is transferred from one variety to another, leaving unchanged the other characteristics of the receiving variety. The classic example of this is the transference of resistance to bunt [*Tilletia caries* and *T. foetida*] in Martin wheat to other wheat varieties [*R.A.M.*, 30, p. 221]. This method has since been applied extensively to the breeding of several non-cereal crops, notably cotton, tobacco, tomatoes, and potatoes. However, since these results are generally less familiar than those of the cereal work and are scattered in a wide range of literature, some of it relatively inaccessible, the data referring to the above four crops is assembled herein in chapters II to V, chapter I being devoted to the general theory of back-crossing. Each chapter includes sections on breeding for resistance to the principal diseases of each crop, and closes with a comprehensive bibliography (177 titles for cotton, 74 for tobacco, 117 for tomato, and 52 for potato).

McLean (R. C.) & Ivimey-Cook (W. R.). **Textbook of practical botany.**—xxiv+476 pp., 125 figs., 1 diag., 1 graph, London, Longmans, Green & Co., 1952. 36*s*.

This companion volume to the Textbook of Theoretical Botany [*R.A.M.*, 31, p. 196] gives in detail the practical work suitable for a general university course, providing a thorough grounding for more comprehensive studies. Part I (pp. 1–30) is devoted to methods, including objects and methods of laboratory study, the microscope, and methods and reagents. A diagrammatic scheme of staining processes is given on p. 30. Part II (pp. 31–53) deals with cytology and Part III (pp. 54–188) with evolutionary morphology, sections 2 and 3 in the latter part being devoted to fungi and bacteria, respectively. Parts IV to VI comprise the morphology and histology (pp. 189–237), sexual reproduction (pp. 238–269), and classification (pp. 270–290) of angiosperms, and Parts VII to X plant physiology (pp. 291–381), modifications of the normal plant form (pp. 382–414), plant ecology (pp. 415–436), and variation and heredity (pp. 437–453), respectively. The appendix includes four sections dealing with microscopical and chemical reagents, reference tables, and addresses of scientific suppliers in Great Britain. The illustrations are almost entirely photographic and are limited to objects which are difficult to obtain or to prepare for examination.

Smith (G.). **Antifungal tests.**—*Biochem. J.*, 50, 5, p. 629, 1952.

In this appendix to a paper by J. H. Birkinshaw *et al.* entitled 'Cyclopolic and cyclopoldic acids, metabolic products of *Penicillium cyclopium* Westling', the author

reports that cyclopoldic acid, at a dosage of 2·5 μgm. per ml., permits less than 1 per cent. germination of the spores of *Botrytis allii* in Czapek-Dox solution at pH 3·5 [cf. *R.A.M.*, 25, p. 353 and next abstract]. Under comparable conditions cyclopolic acid (320 μgm. per ml.) exerts only slight fungistatic activity.

Brian (P. W.), Curtis (P. J.), Hemming (H. G.), Jefferys (E. G.), Unwin (C. H.), & Wright (Joyce M.). **Alternaric acid ; a biologically active metabolic product of Alternaria solani (Ell. & Mart.) Jones & Grout ; its production, isolation and antifungal properties.**—*J. gen. Microbiol.*, 5, 4, pp. 619–632, 1951.

Further studies were made at the Butterwick Research Laboratories, Welwyn, Herts., on the production of alternaric acid by *Alternaria solani* on certain media [cf. *R.A.M.*, 28, p. 636]. Of several strains of the fungus, No. 408, isolated from tomato at the Commonwealth Bureau of Plant Breeding and Genetics, Cambridge, produced the most active culture filtrate when tested for its stunting effect on germ-tubes of *Botrytis allii* [ibid., 31, p. 569 and preceding abstract]. The antibiotic showed no antibacterial activity. After 24 hours 1 μgm. of the acid per ml. decreased the germination of *Botrytis allii* spores by 14 per cent. and the mean germ-tube length from 462 to 12·6 μ. At 10 μgm. the effect was slightly more marked. No trace of stunting occurred, however, until at least five hours after germination commenced.

Routien (J. B.) & Finlay (A. C.). **Problems in the search for microorganisms producing antibiotics.**—*Bact. Rev.*, 16, 2, pp. 51–67, 1952.

Some of the problems arising in the quest for micro-organisms producing antibiotics are discussed under the headings of groups of organisms tested, sources of organisms in nature, methods of isolating and testing cultures, induction of antibiotically active mutants, and prospects. A bibliography of 73 titles is appended.

Krasil'nikov (N. A.). Антибиотики в растениеводстве. [Antibiotics in plant cultivation.]—Природа [*Nature* = *Priroda*, *Moskva*], 41, 7, pp. 17–27, 10 figs., 1952.

Much of this information has already been noticed from another source [*R.A.M.*, 31, p. 621]. In greenhouse experiments anti-bacterial substances from various strains of actinomycetes, such as Nos. 43, 15 [loc. cit.], and 121, were all very effective against the citrus blast organism (*Pseudomonas citriputealis*) [*P. syringae*: loc. cit.]. Similarly, in greenhouse experiments carried out by Mme S. Askarova in 1951, Nos. 73/20, 160, 114, and 265 were all effective against cotton gummosis (*P.* [*Xanthomonas*] *malvacearum*) [loc. cit.], Nos. 160 and 265 increasing germination. Satisfactory control was also obtained in field experiments with Nos. 160, 117, 114, and 86, the percentage of diseased plants in the early stage being 10·7, 10·2, 8·1, and 18·4, respectively, and at the end of the growing season 0·9, 0·4, 0, and 2, respectively, as against 72·4 and 19 per cent., respectively, for the untreated. The highest cotton yields followed treatment with Nos. 160 and 114, i.e., 3,480 and 3,040 kg., respectively, as against 1,640 kg. for the control.

Grossbard (Erna). **Antibiotic production by fungi on organic manures and in soil.**—*J. gen. Microbiol.*, 6, 3–4, pp. 295–310, 1 pl., 3 graphs, 1952.

In studies at the Imperial College of Science and Technology, London, five producers of the antibiotic expansin (= clavacin or patulin), namely, *Penicillium patulum* (strain P. 189) [*R.A.M.*, 30, p. 139], *Aspergillus clavatus*, *A. terreus* (N.C.T.C. 3911), and *P.* spp. A and B, were cultured on various organic manurial materials and soils at 25° [C.]. Extracts from the substrata were assayed at weekly intervals for antibacterial activity by the cylinder- and cup-plate methods, using

Bacillus mycoides and *Bacterium carotovorum* [*Erwinia carotovora*: loc. cit.], and for antifungal activity by the serial dilution method with *Phytophthora parasitica* [loc. cit.] and *Thielaviopsis basicola* as test organisms.

Preliminary tests with *Penicillium patulum* showed that antibiotic production occurred in a number of substrata, of which sugar beet pulp was the best, reaching a maximum in about 14 days and thereafter declining. The addition of 3·5 per cent. glucose considerably increased the antibiotic titre of all media tested and also led to its production in substrata previously negative. Composting removed antibiotic activity, but glucose restored it. Similar results were obtained with *A. terreus* and *A. clavatus*, sugar beet pulp, fresh timothy grass (*Phleum pratense*), and wheat straw all being adequate substrata.

Tests with soils showed that, whether supplemented or not, no antibiotic was produced therein by *Penicillium patulum* unless the substrate was first autoclaved and inoculated with the fungus. When these conditions were fulfilled all four test organisms were completely inhibited by extracts from soils supplemented by 2·5 or 5 per cent. glucose, sugar beet pulp, or wheat straw (in decreasing order of potency). *A. clavatus* and *P.* sp. A were slightly less active than *P. patulum*, followed by *A. terreus*. Steamed soils were less effective than autoclaved.

When soil cultures containing active antibiotic were contaminated with micro-organisms from soil or the air, destruction of activity took place gradually and was complete after about 11 days at 25° C., the loss being less at lower temperatures.

Martin (Norma) & Gottlieb (D.). **The production and role of antibiotics in the soil. III. Terramycin and aureomycin.**—*Phytopathology*, 42, 6, pp. 294–296, 1952.

In further studies at the University of Illinois, Urbana, on the production and function of antibiotics in the soil [cf. *R.A.M.*, 31, p. 448 and preceding abstract], terramycin and aureomycin were shown to be inhibited by illite and bentonite clays and to be removed from aqueous solutions by soil. Even at high concentrations the antibiotics failed to inhibit the multiplication in the soil of *Bacillus polymyxa* and *B. subtilis* [ibid., 32, p. 30], which are very sensitive in broth cultures. On the other hand, both bacteria were suppressed by antibiotic-producing strains of *Streptomyces rimosus* and *S. aureofaciens*. Extraction procedures failed to recover the antibiotics from soil in the bound state.

To be effective in soil an antibiotic should be produced in sufficiently high concentrations to inhibit micro-organisms, should not be adsorbed by soil colloids or combine with other organic materials, and should withstand the dissimilatory activity of the soil microflora. Terramycin and aureomycin do not appear to fulfil these requirements.

Anderson (H. W.) & Gottlieb (D.). **Plant disease control with antibiotics.**—*Econ. Bot.*, 6, 3, pp. 294–308, 1952.

This is a survey and discussion of the literature on the application of antibiotics to plant disease control [see preceding abstracts]. Many of the papers listed in the three-page bibliography have been noticed in this *Review*.

Suggitt (J. W.). **Recent progress in the preservation of organic materials.**—*Chem. Can.*, 4, 5, pp. 37–40, 1 fig., 1952.

Up-to-date developments in the application of preservatives to organic materials, such as paints, plastics, timber, electrical insulation appliances, rope, and leather, are briefly reviewed in the light of 49 contributions to the literature.

Mardon (J.) & Pedder (D.). **Slime control in a tissue mill.**—*Pulp Pap.* (*Mag.*) *Can.*, 53, 4, pp. 122–128, 1952.

Mechanical pulps in a Lancashire paper mill operating a closed white water

system yielded in pure culture species of *Cladosporium*, *Lecythophora* [*Phialophora*], and *Trichoderma*, while *Fusarium*, *Trichoderma*, *Penicillium*, and *Mucor* spp. and *Stachybotrys atra* [*R.A.M.*, 29, p. 166] were obtained from the sulphite. Phenyl mercuric acetate [ibid., 31, p. 346], used at a 'crash' dose of 6 oz. to 2,000 lb. pulp for about every 40 tons of machine production, exerted a strongly fungicidal action which persisted for five hours and was also bacteriostatic. The biologically active mercury in the finished paper never exceeded 0·5 p.p.m. The chemical distributes itself between water and fibre in a ratio of roughly 5:3. There are seven appendixes describing the techniques used for the determination of bacteria and fungi and the estimation of mercury at different stages of the experiment.

Goll (M.), Snyder (H. D.), & Birnbaum (H. A.). **New developments in the diagnosis of paint mildew.**—*Off. Dig. Fed. Paint Varn. Prod. Cl.* 326, pp. 149–154, 6 figs., 1952.

New techniques have been devised at the Nuodex Microbiological Laboratories, Nuodex Products Company, Inc., Elizabeth, New Jersey, for the diagnosis of mildews on paint [*R.A.M.*, 30, p. 282; 31, p. 396, *et passim*]. Rapid gross examination of a chip at least 0·5 sq. in. in size is made under a dissecting microscope which reveals most of the ordinary types of mildew, a species of *Phoma* which causes a pink or purple discoloration [ibid., 19, p. 718], and other erupting forms. The specimen is then studied under the standard microscope using a vertical illuminator as employed in metallurgy. Cultural techniques are time-consuming and not always decisive, because the fungi may be dead. A recent survey covering four areas of Georgia, Tennessee, Missouri, and Ohio showed the importance of this source of deterioration. In the course of the work the significance of a species of *Pullularia* in causing mildew was established [cf. ibid., 31, p. 136].

Harley (J. L.) & McCready (C. C.). **The uptake of phosphate by excised mycorrhizal roots of the Beech. III. The effect of the fungal sheath on the availability of phosphate to the core.**—*New Phytol.*, 51, 3, pp. 342–348, 1 graph, 1952.

Further studies in this series demonstrated that dissection and slicing to expose the cores of beech mycorrhiza [cf. *R.A.M.*, 31, p. 396] to the external medium increase their phosphorus uptake more than that of the sheath. It is concluded that the sheath of intact mycorrhiza restricts the uptake of phosphorus by the cores, the restriction being less at high than at low concentrations.

Brook (P. J.). **Mycorrhiza of Pernettya macrostigma.**—*New Phytol.*, 51, 3, pp. 388–397, 1 pl., 4 figs., 1952.

Studies in the Botany Department, University of Otago, New Zealand, demonstrated that the endemic shrub *Pernettya macrostigma* has endotrophic mycorrhiza anatomically similar to those of *Calluna* [*R.A.M.*, 24, p. 463] and *Vaccinium* [ibid., 17, p. 403], except that they may produce small, spore-like structures. The endophyte does not agree with *Rhizophagus* and is not seed-borne. The shrub is capable of aseptic growth and developed normally without the endophyte in pot cultures.

Buston (H. W.) & King (Elizabeth J.). **Further observations on the sporulation of Chaetomium globosum.**—*J. gen. Microbiol.*, 5, 4, pp. 766–771, 1951.

In studies in the Department of Botany, Imperial College of Science and Technology, London, culture filtrates and mycelial extracts of a strain of *Aspergillus fumigatus* were found to stimulate perithecial production by *Chaetomium globosum* [*R.A.M.*, 32, p. 94], but the factor responsible is not identical with that present in jute extract [ibid., 31, p. 75], the former being more stable towards acid hydrolysis. Although hexose phosphates stimulated fruiting [cf. ibid., 27, p. 331] they did not account for the activity of the jute extract.

Smith (R. H.). **A study of the role of inositol in the nutrition of Nematospora gossypii and Saccharomyces carlsbergensis.**—*J. gen. Microbiol.*, 5, 4, pp. 772–780, 1 graph, 1951.

Studies in the Department of Botany, Imperial College of Science and Technology, London, demonstrated the uptake of meso-inositol [*R.A.M.*, 24, p. 448] by *Nematospora gossypii*. In the presence of only 0·4 μgm. per ml. of liquid medium nearly maximum growth had taken place after eight days; when 6 μgm. were available most of the inositol was still taken up but the dry weight of mycelium was increased by only about one-third.

Bercks (R.). **Weitere Untersuchungen zur Frage der Altersresistenz der Kartoffelpflanzen gegen das X-Virus.** [Further studies on the question of mature plant resistance of Potatoes to the X-virus.]—*Phytopath. Z.*, 18, 3, pp. 249–269, 1951.

The results of further studies at the Brunswick branch of the Biological Institute confirmed previous observations as to the resistance (gauged by the 'leaflet method') of mature Flava and Capella potato plants to infection by potato virus X [*R.A.M.*, 31, p. 535 and next abstract]. For this series of experiments inoculum was obtained from the varieties Direktor Johanssen, Kaiserkrone, Jubel, Prisca, Wekaragis, and Flava. Flava was susceptible at an early stage of growth [cf. ibid., 30, p. 284] to the strains of virus X isolated from Direktor Johanssen and Kaiserkrone; Capella was immune. In experiments on permanent fertilizer plots poor nutrition contributed to freedom from virus infection [cf. ibid., 32, p. 95] and expedited the development of resistance associated with maturity.

Bercks (R.). **Fortgeführte Freilanduntersuchungen über die Altersresistenz von zwei Kartoffelsorten gegen das X-Virus.** [Further field investigations on the mature plant resistance of two Potato varieties to the X-virus.]—*Züchter*, 22, 3, pp. 85–91, 1952.

In this further series of experiments on permanent fertilizer potato plots at Brunswick [see preceding abstract], the mature plant resistance of Flava and Capella to potato virus X was not influenced by nutritional differences approximating to those occurring in agricultural practice. Mature plant resistance, whether gauged by the infection of entire plants or inoculated shoots, sets in at different times in the two varieties, being naturally earlier in the medium-early Flava than in the late Capella. Even in young plants, especially of Capella, the spread of the virus in vigorously growing leaves is sometimes arrested, evidently through the operation of some as yet unexplained form of resistance.

Macleod (D. J.), Bagnall (R. H.), & Rankin (D. F.). **Testing of Potatoes for resistance to virus diseases.**—Abs. in *Proc. Canad. phytopath. Soc.*, 19, pp. 17–18, 1952.

In further work by the Dominion Laboratory of Plant Pathology, Fredericton, New Brunswick, in co-operation with the Dominion Experimental Station, Fredericton, on the breeding and testing of potatoes for resistance to virus diseases [*R.A.M.*, 31, p. 509] immunity from potato virus X was confirmed in four seedlings of American origin, while field resistance (host hypersensitivity) to viruses X, Y [see next abstract], A [ibid., 31, p. 509], and B [strain of virus X: cf. ibid., 24, p. 244; 31, p. 627] was found in some commercial varieties and certain new seedlings. Hypersensitivity to these four viruses was more valuable than host tolerance for their control under commercial field conditions. Hypersensitivity to potato leaf roll virus [loc. cit.] was not found in any seedling examined, though there was a transitory type of field resistance in certain seedlings which

conditioned the plants to withstand exposure to the virus under field conditions for periods ranging up to seven consecutive seasons.

THUNG (T. H.). **Internationale conferentie over Aardappelvirusziekten Wageningen-Lisse 13–16 Augustus 1951.** [International conference on Potato virus diseases at Wageningen-Lisse 13–16 August, 1951.]—*Maandbl. LandbVoorl-Dienst*, 8, 11, pp. 421–430, 2 figs., 1951.

At this International Conference on Potato Diseases in Holland an introduction by T. H. THUNG was followed by a discussion on nomenclature and classification [*R.A.M.*, 29, p. 602], initiated by [E.] KÖHLER and [G.] ROLAND.

E. KÖHLER described his electron microscope studies of viruses, resulting in new concepts regarding particle structure of tobacco mosaic, found to be spiral-shaped, and potato virus X [ibid., 31, p. 397].

E. KÖHLER, G. ROLAND, and [H. N.] HANSEN reported on the respective methods of potato virus diagnosis used in Germany (two indicators, *Gomphrena globosa* [ibid., 31, p. 138; 32, p. 62] and potato seedling A6), Belgium (serological procedures), and Denmark (*G. globosa*).

[MARIA P.] DE BRUYN OUBOTER gave particulars of the application of the serological technique to the study of a hitherto undescribed potato virus [see next abstract]. IR VAN SLOGTEREN explained a method of procuring large quantities of antiserum with a high titre against carnation mosaic virus [see above, p. 128]. The level of purification was so high that the antiserum contained practically no antibodies against the normal components of the host. He further stated that the spontaneous flocculation of potato sap, which tends to impede serological investigation, is preventable by the previous admixture of gypsum. CREMER outlined a technique for the large-scale production of antiserum against potato virus Y. [P.] LIMASSET gave an account of his technique for the preparation of an antiserum against *Dahlia* mosaic virus [ibid., 30, p. 231].

[L.] BROADBENT contributed a report on tests at Rothamsted Experimental Station demonstrating the importance of winged aphids in the spread of potato leaf roll and Y viruses [ibid., 31, p. 200].

[D.] LIHNELL gave details of a survey conducted in Sweden during 1949 and 1950 to ascertain the distribution of beet yellows virus [ibid., 29, p. 342], in which the plants colonized by *Aphis fabae* and *Myzus persicae*, the aphid vectors of the disease, were treated with a solution of radio-active sodium phosphate [cf. ibid., 31, p. 170], thus enabling their movements in the field to be followed.

Experiments performed by [G.] COCKERHAM, of the Scottish Society for Research in Plant Breeding, with hypersensitive *Solanum* varieties and strains [cf. ibid., 31, p. 627] are described. The necrotic reaction is governed by four dominant genes, of which two can operate against potato virus X, the third against A virus strains, and a fourth against the 'C' strain of virus Y. Thus, hypersensitiveness (or field resistance) towards the most prevalent strains of virus Y can be developed in the potato but not through the agency of a single factor; crosses with other *S.* spp. are essential. Of great importance is the proximity of the genes controlling necrosis, which occur in juxtaposition in both tetraploid and diploid material.

[J. P. H.] VAN DER WANT'S contribution, read by van Raalte, dealt with experiments to determine the influence of amino acids on the development of local necrosis on *Nicotiana glutinosa* leaves inoculated with tobacco mosaic virus [cf. ibid., 31, p. 404]. Longitudinal halves of tobacco leaves were placed in various amino acid solutions and the corresponding halves in water for 12 to 24 hours before and also after inoculation. Significantly fewer lesions were formed on the leaves treated with 0·5 per cent. histidine or arginine than on those immersed in water.

T. H. THUNG advanced the following hypothesis of virus infection. Virus particles have a constitution much more complex than can be discerned with the aid

of the electron microscope. Two of the constituents control the capacity of the particle for multiplication in its host, one being responsible for the localization of the infective principle in a susceptible portion of the protoplasm, while the other acts biochemically on the enzymes which synthesize the molecular groups, such as ribose and nucleotides, requisite for virus formation. Thus, the infective principle may be only a fraction of the visible virus particle. In certain types of soil it may retain its activity for lengthy periods before entering the roots of susceptible plants.

J. P. H. Van Der Want described the potato stem-mottle and tobacco rattle diseases, both caused by the potato stem-mottle virus [ibid., 28, p. 86; 31, p. 405], which may have some connexion with spraing. The persistence of the virus in the soil may be attributable to its adsorption by the clay mineral montmorillonite. In the ensuing discussion Professor E. van Slogteren and M. P. de Bruyn Ouboter stated that they had isolated from tulips, narcissi, and hyacinths viruses serologically related to potato stem-mottle and inducing rattle symptoms in tobacco [cf. ibid., 30, p. 506]. The affected hyacinths presented the picture known in the bulb-growing district as 'malaria', which has been observed before, mostly in newly reclaimed areas and excavated dunes.

[A.] Rozendaal conducted field demonstrations on several potato viruses. Three strains of the leaf roll virus could be differentiated in the progeny of diseased tubers exposed for three to five weeks to a temperature of 38° C., which in most cases inactivated the infective principle. Two strains of potato virus A could be distinguished in the Rode Star and light Rode Star varieties. A combination of virus A with the stipple-streak virus [potato virus Y] from the latter variety gave rise to typical complexes, the severity of which depended on the virulence of the A component. Attention was drawn to a markedly aberrant strain of the potato aucuba mosaic virus occurring in May Queen. The old Dutch potato variety Gelderse Roode is hypersensitive to virus X and incompletely so to virus A. Sap inoculations with the former induced only local foliar necroses, whereas the progeny of more than half the tubers infected by means of a contaminated needle or knife developed symptoms of top necrosis, due to the failure of the tuber tissue to respond with a necrotic reaction and thus isolate the virus.

Rozendaal (A.). **Nieuwe virusproblemen bij de Aardappel.** [New virus problems in the Potato.]—*Meded. N. A. K.*, 8, 12, pp. 94–98, 2 figs., 1952.

A full account is given of the fruitless attempts of Dutch plant pathologists to ascertain the cause of symptoms in breeding plots of certain potato varieties, notably Bintje and Eigenheimer, which were definitely distinct from those of potato virus X and were also shown by serological tests not to be attributable to potato virus A. The question arose whether the rather delicate, flaccid plants, later tending to swell, with somewhat pallid, deep-veined leaves, represented a mutation, but further serological experiments in 1951 eventually demonstrated the presence of a 'new' virus [see preceding abstract], sometimes in association with potato virus A, e.g., in 'light' Industrie and some English plants examined by Professor van Slogteren. The 'new' virus was also detected in 'dark' Industrie, Eersteling [Duke of York], King Edward, and Up-to-Date, imported material of the two last-named having possibly up to 100 per cent. infection. The 'new' virus was shown to be readily transmissible by sap inoculation, but only with difficulty or not at all by aphids. Various facts suggest the possibility that a very attenuated strain of potato virus A may be concerned.

Mehta (P. R.) & Singh (J.). **Some problems of Potato diseases in the Uttar Pradesh.** —*Agric. Anim. Husb., Uttar Pradesh*, 1, (*Potato Suppl.*), pp. 43–53, 6 figs., 1 diag., 1951.

In this review of the most important potato diseases in the Uttar Pradesh the

history of each disease, its symptoms, behaviour of the causal agent, and control are discussed in some detail. At the Simla Potato Breeding Station hybrids 2, 12, 13, 19, and 22 from crosses of *Solanum demissum* with *S. tuberosum* showed fair resistance to certain [unspecified] mosaic viruses. During studies at the laboratory of the Plant Pathologist to the Government in 1950–51 bacterial ring rot (*Corynebacterium sepedonicum*) [cf. *R.A.M.*, 31, p. 574] was most successfully transmitted by root inoculation to the varieties Up to Date, Majestic, Metupallayum, and Fx Nos. 101, 950, and 441, disease symptoms developing 30 to 35 days later. Phulwa was found to be quite resistant. For the control of ring rot 20- to 30-minutes' seed tuber treatment with mercuric chloride (1 in 500 or 4 oz. to 15 gals. water) or 3 minutes in 'acid mercury' were quite effective. For cut tubers a 15-minute treatment with the former (1 in 500) was sufficient.

For the control of blight (*Phytophthora infestans*) [ibid., 31, p. 540 and next abstract] the measures found to be helpful included exposing seed tubers to summer heat for about a week in April and May before placing in cold storage, and deep earthing-up (6 in.) to avoid direct infection of tubers. As a result of over 90 per cent. infection with early blight (*Alternaria solani*) [ibid., 29, p. 168] at the Government Vegetable Research Station, Lucknow, in 1949–50 the yield was reduced to 50 to 70 maunds [1 maund = 82·284 lb.] per acre. Three or four sprays with 1 per cent. Bordeaux mixture, 3 per cent. perenox, 0·1 per cent. yellow cuprocide, or dithane Z-78 at 15-day intervals all gave good control, the first three increasing the yield by 50 per cent.

The introduction of a rigid 'seed' potato inspection and certification scheme in Uttar Pradesh is strongly urged and plans for the working of the scheme are suggested.

Vasudeva (R. S.) & Azda (R. N.). **Efficiency of certain fungicides against Potato late blight and assessments of loss due to the disease.**—*Amer. Potato J.*, 29, 3, pp. 61–71, 3 graphs, 1952.

An assessment of losses due to potato blight (*Phytophthora infestans*) in India [see preceding abstract], which is very severe in the Simla Hills region where supplies of seed potatoes are grown, was made at the Central Seed Potato Certification Station, Kufri, in accordance with the key formulated by the British Mycological Society [ibid., 27, p. 89]. In the 1948 and 1949 experiments Darjeeling Red Round, planted on ridges 2 ft. apart, was treated regularly at 10-day intervals with seven applications of various fungicides during each season. Perenox ¼ per cent. at 2½ lb. per 100 gals. per acre and Burgundy mixture (10 : 12½ : 50) gave the best control and increased the yield (average for the two years) by 71·4 and 139·5 per cent., respectively. The results indicate that the yield alters in relation to the amount of leaf area destroyed by the fungus and that the rate of disease progress, together with the total period during which the foliage remains green, a result of protection provided by the fungicide against the disease, greatly influence the yield.

Hirt (W.). **Zur Bekämpfung der Kraut- und Knollenfäule der Kartoffel. Aus der Tätigkeit der Pflanzenschutzorganisation der Landwirtschaftlichen Genossenschaft Kirchberg (Bern).** [Contribution to the control of Potato top and tuber blight based on the work of the Plant Protection Organization of the Agricultural Co-operative Society, Kirchberg (Bern).]—*Schweiz. landw. Mh.*, 30, 6, pp. 213–219, 7 figs., 1 diag., 1 graph, 1952.

One of the most important potato-producing regions of central Switzerland, extending over 300 ha. in the Lower Emme plateau, falls within the sphere of activity of the Kirchberg (Bern) Agricultural Co-operative Society. About 60 per cent. of the area is planted with Bintje, 20 per cent. with Eerstelingen [Duke of

York] and Saskia, and the remaining 20 per cent. with other varieties. Given the susceptibility to blight (*Phytophthora infestans*) [*R.A.M.*, 30, p. 262 and above, p. 138] of the varieties covering 70 per cent. of the relatively small area, the development of primary foci of infection is regarded as inevitable, even with the adoption of appropriate cultural measures, such as exclusion of diseased tubers from the compost and a judicious crop rotation. It is proposed that in future the fields shall be inspected at the end of May for the presence of primary foci to facilitate accurate forecasting and timely control.

In 1951 the amount of copper solutions used by the Society for the treatment of 250 ha. was 420,000 l. and the estimated increase in yield ranged from 20 to 60 per cent.

Turlapova (Mme A.). **New varieties of Potatoes.**—*Kolhoz. Proizv.* [*Colfarm Prod.*], *1951*, 5, pp. 34–35, 1951. [Abs. in *Hort. Abstr.*, 21, 4, p. 513, 1951.]

New potato varieties resistant to wart [*Synchytrium endobioticum*: *R.A.M.*, 25, p. 468] and blight (*Phytophthora* [*infestans*: ibid., 20, p. 545]) are now replacing the older varieties grown in the U.S.S.R. The special qualities of certain varieties are described.

Bazán de Segura (Consuelo). **Nuevas enfermedades de la Papa en el Peru. Esclerotiniosis de la Papa. Podredumbre gris de la Papa.** [New diseases of the Potato in Peru. Sclerotiniosis of the Potato. Grey mould of the Potato.]—*Bol. Invest. Exp. agríc. Lima* 41, 9 pp., 13 figs., 1952. [Mimeoprinted.]

Sclerotinia sclerotiorum [*R.A.M.*, 31, p. 292] was observed on *Solanum andigenum* for the first time in Peru in 1950. On the same estate it was found on *Nicandra physaloides*, mostaza (*Brassica campestris*) [ibid., 31, p. 208], and *Chenopodium* sp. Other hosts of the fungus in the country are bean (*Phaseolus vulgaris*), sunflower, flax [ibid., 28, p. 174], lettuce, cabbage, peas, and vegetable marrow, the two first-named sustaining particularly heavy damage.

Potatoes in commercial plantings were attacked in 1950 by *Botrytis cinerea* [cf. ibid., 28, p. 4], which had already been observed in 1942 on greenhouse plants of the Irish Cobbler variety at the National Centre of Agricultural Investigation, Lima. The fungus was subsequently detected on beans for the first time in Peru, in the vicinity of the potato fields.

Essential information on the symptomatology, etiology, and control of both diseases is summarized.

Tanaka (S.) & Yoda (A.). **The metabolism of the organism of Helminthosporium disease of the Rice plant.**—*J. chem. Soc. Japan*, Pure Chem. Sect., 73, 1, pp. 8–10, 3 graphs, 1952. [Japanese. Abs. in *Chem. Abstr.*, 46, 19, p. 9154, 1952.]

Studies at Kyoto University, Japan, showed that an accumulation of mannitol gradually replaces the soluble sugars present in the mycelium of *Ophiobolus miyabeanus* [*R.A.M.*, 32, p. 36] at an earlier stage of its development. The mannitol may serve as a reserve nutrient. The growth of the fungus in culture was accompanied by utilization of the nitrate in the medium. It inverted cane sugar and assimilated glucose more rapidly than fructose.

Lasschuit (J. A.) & Vollema (J. S.). **De meeldauwresistente cloon LCB 870.** [The mildew-resistant clone LCB 870.]—*Bergcultures*, 21, 13, pp. 257, 259, 261, 1952. [English summary.]

This information on crown-budding with the Javanese *Hevea* rubber clone LCB 870 for resistance to *Oidium* [*heveae*] and the effect on yield has already been noticed in part from another source [*R.A.M.*, 31, p. 630].

Soesman (J. G.). **Heveatapvlakziekten en haar bestrijding.** [*Hevea* tapping surface diseases and their control.]—*Bergcultures*, 21, 12, pp. 243, 245, 2 diags., 1952.

Hevea rubber tapping surface diseases in Indonesia fall into two groups, of which (*a*), represented exclusively by brown bast [*R.A.M.*, 31, p. 400; 32, p. 98], is caused by the withdrawal of latex from the tree, and (*b*) comprises the infectious diseases mouldy rot [*Ceratocystis fimbriata*: ibid., 31, p. 399] and patch canker (*Phytophthora*) [spp.: loc. cit. and ibid., 20, p. 132; 30, p. 74]. Brown bast may be combated by tapping at three- to four-day intervals instead of every other day. As a precaution against fungal infection a cold emulsion, consisting of 85 per cent. solar and 5 per cent. each of carbolineum plantarium [ibid., 30, p. 74] and microwax, plus [unspecified] residue, is applied to the exposed surface at the close of the customary ten-day tapping period. On the first indication of mouldy rot the tapping surface and the cortex up to 3 cm. above the site of infection are coated with a warm emulsion of 60 per cent. hard wax, 30 per cent. acid-free tar, and 10 per cent. carbolineum plantarium. With patch canker the diseased area and a surrounding zone 3 cm. in width are scraped off down to $\frac{1}{2}$ cm. from the cambium, and the patch is then isolated by a circular cut as far as the xylem. Next day the isolated patch is covered with warm, soft asphalt to assist the sloughing-off of the infected bark [cf. ibid., 32, p. 98].

The accumulation of latex coagulum under young tapping bark, commonly known as 'lump canker', is treated as follows. The cake of latex is removed as quickly as possible and the thin bark below which it was situated fixed down to its normal position on the cambium, the resulting wound being covered immediately with the above-mentioned emulsion for mouldy rot control, otherwise a woody overgrowth develops, which requires removal with a chisel before the application of the emulsion.

Nicholas (D. J. D.). **The use of a fungus Aspergillus niger (M strain) for determining trace metal deficiencies in soils.**—*Fruit Yearb.* 6 (*1953*), pp. 113–116, 3 pl., 1952.

This information on the microbiological method, applied in experiments at Long Ashton Research Station, Bristol, for the assay of trace metals in soils using *Aspergillus niger* [*R.A.M.*, 31, p. 32] has already been noticed from another source [loc. cit.].

Schipstra (K.). **Ziekteverschijnselen bij verschillende gewassen op ijzerhoudende beekgronden.** [Pathological symptoms in various crops on iron-containing brook soils.]—*Maandbl. LandbVoorlDienst*, 9, 7, pp. 271–274, 2 figs., 1952.

On soils intersected by brooks in eastern Holland and North Brabant various crops display symptoms pointing to serious nutritional disturbances. For instance, chlorosis suddenly develops in patches or strips of beet crops. Growth is arrested, the leaves are erect, spoon- or hood-shaped or of irregular habit, pale yellow to whitish, and the roots are brown or dark-coloured. Similar symptoms occur on swedes. Pale stripes appear on winter rye leaves, while winter oats and other cereals and pasture grasses are also affected.

The sandy loam soils bearing the chlorotic crops are waterlogged during the winter and have a very high iron content [see next abstract]. In 1949 an experimental field planted with Eckendorfer beets was given amendments of powdered lime (from 0 to 16,750 kg. per ha.) and superphosphate (0, 120, and 300 kg.), with the normal quantities of potassium and nitrogen. The lime raised the beet yield from 70,000 to 140,000 kg. per ha. and the pH level from between 4·6 and 5·7 to a maximum of 6·5. The effect of the phosphate treatment was much less marked. The highest yield of oats was produced by a combination of 3,500 kg. lime and 300 kg superphosphate per ha.

Postma (H.). **De mogelijke oorzaak van ziekteverschijnselen bij verschillende gewassen op zure, sterk ijzerhoudende gronden in de buurt van de Overijselse Vecht. Voorloopige mededeling.** [The possible cause of the pathological symptoms in various crops on acid soils with a very high iron content in the vicinity of the Overijselse Vecht. Preliminary note.]—*Maandbl. LandbVoorl-Dienst*, 9, 7, pp. 275–276, 1952.

An analysis of the brook soils bearing chlorotic crops [see preceding abstract] revealed abnormally high aluminium [cf. *R.A.M.*, 6, p. 117] and iron contents and low calcium. Remedial measures should include proper drainage and raising the pH level to 7 in heavy loam soils and 6 to 6·5 in lighter ones.

Dutt (N. L.). **The present Cane varietal position in India.**—*Agric. Anim. Husb., Uttar Pradesh*, 1, 7–8, pp. 30–36, 4 figs., 1 diag., 1950–51.

The information in this paper on the characters of the principal sugar-cane varieties grown in India in 1948–49 has already been noticed from another source [*R.A.M.*, 31, p. 298].

Cash (Edith K.). **A record of the fungi named by J. B. Ellis. Part I Acanthostigma —Gymnosporium.**—*Spec. Publ. Plant Dis. Surv.* 2, 1, pp. 1–165, 1952.

An alphabetical list is presented of the validly published names, nomina nuda, and unpublished herbarium names bestowed by J. B. Ellis. The citation to the original publication is followed by additional references found in his writings and to the exsiccati that he issued. The more important synonymy is added indicating the subsequent disposition of the species by later authors. In instances where Ellis recombined a species under another name references are grouped usually under the last he used with cross references to the others. Hosts are cited as in the original except for the addition of scientific names in parentheses where necessary.

Naito (T.). **The mycoflora of southern Kiusiu IV.**—*Sci. Rep. Kagoshima Univ.* 1, pp. 71–81, 11 figs., 1952.

This further instalment of the author's studies on the mycoflora of southern Kyushu, Japan (cf. *Bull. Kagoshima agric. Coll.*, 15, p. 31, 1949), comprises 18 species, of which eight are new. *Sphaerulina cucurbitae* n.sp., producing irregular, greyish-brown spots, becoming confluent over large areas of both leaf surfaces of *Cucurbita moschata* var. *toonas*, is characterized by scattered, erumpent, subglobose, dark brownish perithecia, 90 to 100 μ in diameter, with an ostiole 20 μ in diameter; the broadly obovate, subsessile, aparaphysate asci are 45 to 50 by 33 to 38 μ, and the hyaline, triseptate, oblong-cylindrical ascospores, 26 to 28 by 10 to 11 μ.

Fracchiaea subconnata occurs on dead twigs of *Grevillea robusta* and *Liriodendron tulipifera*.

Living leaves of *Phormium tenax* are attacked by *Diplodia minuscula*, *Gloeosporium phormii*, and *Hendersonia phormii* n.sp., the last-named producing on both surfaces subcircular, irregular, or confluent spots, becoming dry and assuming a dirty pale tinge with brownish margins. The sparse, erumpent, conical or ovoid, subcarbonaceous, dark chestnut-brown pycnidia are 90 to 100 μ in height and 50 to 85 μ in diameter, with an ostiole 15 to 20 μ wide, and the cylindrical, straight or slightly curved, triseptate, light brown conidia, 38 to 42 by 3 to 3·5 μ, are borne on cylindrical, curved, simple conidiophores of the same colour.

Petrak (F.). **Beiträge zur Pilzflora von Niederösterreich.** [Contributions to the mycoflora of Lower Austria.]—*Sydowia*, 6, 1–4, pp. 227–240, 1952.

This critically annotated list of 49 species of fungi from Lower Austria includes, besides two new combinations, *Sphacelotheca reiliana* on the male inflorescences of

maize [C.M.I. map No. 69], *Nectria galligena* on young ash stems [ibid., No. 38; cf. *R.A.M.*, 30, p. 202], *Asterostomella hranicensis* (*Septoria quercicola*) [ibid., 26, p. 173] on living and dying leaves of oak (*Quercus lanuginosa*) [*Q. pubescens*], and *Pilidium concavum* on living foliage of *Rhus cotinus*.

SOEHNER (E.). **Bayerische Hysterangium-Arten.** [Bavarian species of *Hysterangium*.]—*Sydowia*, 6, 1–4, pp. 246–264, 1 pl., 1952.

One new species of *Hysterangium* is included among the 14 collected in Bavaria and studied critically by the author.

Proceedings of the Ninth Annual Conference of the Indian Tea Association held at Tocklai Experimental Station on the 3rd, 4th, and 5th December, 1951.—82 pp., 6 diags., 7 graphs, [? 1952].

Dr. G. M. DAS states (pp. 14–17) that experiments have been made recently at the Tocklai Experimental Station, India, on the addition of red and yellow dyes to perenox and coppesan, applied with a low volume sprayer, to ascertain whether tea bushes are covered thoroughly. The red dye, used at concentrations of 0·5 and 0·25 per cent. with perenox and coppesan, respectively, was clearly visible immediately after spraying and also when dry. The cost would depend on the amount of spray fluid required for the type of sprayer and nozzle used and the condition of the bushes, but as it appeared that the cost of the dye would be approximately three times that of the perenox for the same area, it would be better to give three rounds of perenox to ensure adequate coverage. The effect of the dye on the efficiency of perenox against blister blight [*Exobasidium vexans*: *R.A.M.*, 32, p. 105] has not been investigated. Because it is impossible for operators to see the dust being distributed from the Whirlwind duster used in Ceylon [ibid., 31, p. 517] the incorporation of dyes into fungicidal dusts is also being investigated.

More efficient methods of applying chemical sprays to tea are required. At present the central charge pump, battery pneumatic, knapsack sprayer system is the most satisfactory. Experience at Tocklai suggests that liquid spraying is more satisfactory than dusting. It is claimed that the micron sprayer mist blower [loc. cit.] can distribute only ½ gal. liquid evenly over an acre. According to W. W. MAYNE the battery type of sprayer has been very successful against blister blight in South India, using approximately 16 gals. per acre with an I.C.I. gardener's nozzle. About 12 lb. dust per acre are needed with the Whirlwind duster, nine dusting rounds practically doubling the crop yield. Dusting was preferable to large-scale spraying as it gave economic returns with a small labour requirement. The Whirlwind duster enables 80 to 100 acres to be treated daily.

SNIJDERS (J. H.). **Bodembescherming en blisterblight.** [Ground protection and blister blight.]—*Bergcultures*, 21, 7, pp. 139, 141, 143, 145, 1 fig., 1952.

In connexion with the control of blister blight (*Exobasidium vexans*) in Indonesian tea plantations by rational cultural practices [cf. *R.A.M.*, 31, p. 210 and next abstract], the author recommends the adoption of conservative methods of pruning and weeding and the maintenance or renewal of shade crops, such as *Acacia decurrens*.

LAOH (J. P.). **Een beschouwing over de technische en economische mogelijkheden van de motor-poederverstuiving van koperfungiciden met inheemse draagstoffen bij de bestrijding van de blister blight.** [A survey of the technical and economic possibilities of the application of copper fungicides with home-produced spreaders by means of motor-dusters for blister blight control.] —*Bergcultures*, 21, 10, pp. 192–193, 195, 1952.

The relative merits of spraying and mist blower dusting for the control of blister

blight (*Exobasidium vexans*) in Java [see preceding abstract] are discussed in the light of recent experiments. Under present conditions spraying is more effective and cheaper than dusting in young gardens where the bushes have been pruned and are readily accessible to knapsack machines, but in the tall, dense stands reserved for plucking dusting is more economical. However, unless the cost of the fillers used with 4 per cent. copper oxychloride and 8 per cent. koneprox can be kept within a limit of 100 cents per kg., it is advisable to resort to foreign dusts, e.g., cuprosana at 2 and 6 per cent. [*R.A.M.*, 32, p. 105]. Of the four fillers tested volcanic and pumice stone tuffs proved definitely superior to lime and kaolin.

Shade had little effect on the incidence of stem and leaf infection by *E. vexans* during a period of virulent attacks, except between the two levels 40 and 60 per cent., when a marked difference was evident, irrespective of weather conditions, the risk of infection apparently increasing by leaps and bounds at a shade density exceeding 50 per cent.

Köhler (E.). **Untersuchungen zur Premunitätsfrage. I. Das Vordringen von Virus aus der Sprossachse in das prämune Blatt im Pfropfversuch.** [Studies on the question of 'premunity'. I. The advance of virus from the shoot axis into the 'premune' leaf in the grafting test.]—*Phytopath. Z.*, 17, 4, pp. 462–467, 1951. [Received 1952.]

At the Virus Research Institute, Celle, Hanover, in 1950, the upper portions of shoots of mature Samsun tobacco plants, which had been inoculated at an early stage of growth with the TM/S strain of tobacco mosaic virus, were grafted on plants of the same variety inoculated either before or after the operation with para-tobacco mosaic virus [*R.A.M.*, 29, p. 78]. The progress of the latter was followed in the first leaf of the scion by sap inoculation of white Burley tobacco leaves. It advanced, apparently unhindered by the tobacco mosaic virus, into the petiole and midrib, but was completely prevented from spreading into the lamina, in contrast to the leaves of the controls, in which there was evidently no check to its extension. It is postulated that the para-tobacco mosaic virus passes into the petiole and midrib of tobacco mosaic infected leaves by a mass flow proceeding in the phloem, but that its spread in the lamina is impeded by its inability to multiply therein, presumably because of the exhaustion of the substratum by the tobacco mosaic virus.

Leben (C.) & Fulton (R. W.). **Effect of certain antibiotics on lesion production by two plant viruses.**—*Phytopathology*, 42, 6, pp. 331–335, 1 graph, 1952.

At the University of Wisconsin, Madison, an agar plate technique was developed for determining the inhibitory action of test substances on lesion production by plant viruses. Detached leaves were placed, inoculated side uppermost, on an agar medium containing the substance and incubated in the dark. It was necessary to add glucose [cf. *R.A.M.*, 31, p. 317] to the agar to induce lesion formation in cowpea by the tobacco necrosis and tobacco ring spot viruses (with which most of the work was carried out). Of the nine antibiotics tested [cf. ibid., 31, p. 319], streptothricin and terramycin, both at 1 mg. per ml., suppressed lesion development, as also did potassium cyanide (0·65 mg. per ml.) and sodium azide (0·65 and 0·065). Terramycin, potassium cyanide, and sodium azide failed to reduce the infectivity of either virus when mixed with the inoculum. Of two samples of streptothricin tested, neither modified the activity of tobacco ring spot virus but one partially inactivated tobacco necrosis. The rate of increase of the latter, judged by local lesion assay, was slower in leaves on a terramycin-containing medium than in those on an unsupplemented substratum.

Hirth (L.). **Contribution à l'étude de l'inhibition du virus de la mosaïque du Tabac par diverses substances tanniques. Mode d'action de ces dernières.** [Contribution to the study of the inhibition of Tobacco mosaic virus by various tannic substances. Mode of action of the last-named.]—*Ann. Inst. Pasteur*, 80, 5, pp. 458–469, 1951.

In the first of two experiments to determine the influence on the virulence of tobacco mosaic virus of extracts from healthy *Pelargonium zonale* and those infected with crown gall [*Bacterium tumefaciens*], containing, respectively, 0·038 and 0·041 per cent. geraniatannic acid, the following numbers of lesions developed on half leaves of *Nicotiana glutinosa* [cf. *R.A.M.*, 30, p. 198]: controls (virus plus water) 45; virus plus undistilled healthy extract 20; or with distilled healthy 34; virus plus undistilled crown gall extract 46 (control 44); or with distilled 47 (control 48). In the second test the figures were as follows: undistilled healthy 16; distilled healthy 23; undistilled crown gall 38; and distilled crown gall 27, with 47, 31, 37, and 28 for the four controls, respectively.

Further tests proved that purified tannic [see above, p. 135], and geraniatannic acids extracted from the plant were about equally toxic to the virus at high concentrations, but at 0·5 per cent. the latter was inactive, whereas the former did not lose its inhibitory power until the concentration reached 0·25 per cent. The purified tannin extracts of tea, horse-chestnut, and hawthorn [*Crataegus* sp.] exerted a definitely inhibitory action on the virus, though a much weaker one than tannic acid. For instance, the lesions developing on half leaves of *N. glutinosa* inoculated with (*a*) pure virus and (*b*) virus plus 1 per cent. tea tannin numbered 54 and 30, respectively; the same at 0·5 per cent., 65 and 36; 1 per cent. horse-chestnut reduced the numbers from 65 to 45 and the same at 0·5 per cent. from 70 to 60; the corresponding reductions for hawthorn at the two concentrations were from 70 to 45 and from 74 to 60; and for tannic acid from 67 to 1 and from 42 to 5.

Further experiments showed that the tannin-virus complex, which results from a combination with the protein fraction of the virus, can be dissociated at pH 8·2, allowing the latter to regain a measure of its original virulence.

Ruizhkov (V. L.) & Loidina (Mme G. I.). Чувствительность к вирусу и накопление вируса Табачной мозаики (ВТМ) листьями разного возраста. [Susceptibility and accumulation of Tobacco mosaic virus (TMV) in the leaves at different stages of growth.]—Микробиология [*Microbiology*], 20, 6, pp. 519–524, 1 graph, 1951.

In studies at the Microbiological Institute of the U.S.S.R. Academy of Sciences, Moscow, *Nicotiana glutinosa* plants were inoculated with tobacco mosaic virus [cf. *R.A.M.*, 27, p. 162] by rubbing with infective tobacco sap. Counts of lesions per sq. cm. of leaf surface showed that normally the youngest and oldest leaves were least and the middle leaves most susceptible, but not when the top of the plant was removed or the middle leaves injured by smearing with lanoline containing 2,4-D [ibid., 28, p. 549]. In further experiments tobacco leaves on the plant were found to accumulate different quantities of virus according to their stage of growth and the developmental condition of the plant, the virus content being lower in younger than in older leaves, which are poorer in nitrogen and protein. No correlation was indicated between the titre reached by tobacco mosaic virus in inoculated leaves and their content of nitrogen, protein, and phosphorus [ibid., 29, p. 480], and no proof was obtained that deficient tobacco leaves isolated from the plant accumulate less tobacco mosaic virus than those on the plant receiving normal nutritives.

Correlation of the incidence of plant disease and temperature.—*Nat. agric. Chem. Ass. News*, 10, 4, p. 6, 1 graph, 1952.

A graph, prepared by P. R. Miller, is presented to illustrate the close correla-

tion of January temperature and the occurrence of tobacco blue mould [*Peronospora tabacina*: *R.A.M.*, 29, p. 437; 31, pp. 150, 226; 32, p. 105] at five southern localities in the United States over a period of 20 years. Dr Miller states that there has been remarkable consistency in the behaviour pattern of the development of the disease during that time, and a system of forecasting outbreaks based on the observations illustrated by the graph would have been about 90 per cent. accurate. Georgia and Florida are the key areas, infections in the Carolinas and Virginia following according to the prevailing weather conditions in March, April, and May, the disease potential being altered by the quantity of fungicides applied in a given year.

Steinberg (R. A.). **Frenching symptoms produced in Nicotiana tabacum and Nicotiana rustica with optical isomers of isoleucine and leucine and with Bacillus cereus toxin.**—*Plant Physiol.*, 27, 2, pp. 302–308, 2 figs., 1952.

In further experiments at the Division of Tobacco, Medicinal and Special Crops, Bureau of Plant Industry, Beltsville, Maryland, the addition of either L-isoleucine or L-alloisoleucine to cultures of Maryland Medium Broadleaf and Havana 142 tobacco and *Nicotiana rustica* (Mahorka I) grown aseptically on mineral agar under about 500 foot-candles of white fluorescent light induced symptoms of frenching [*R.A.M.*, 31, p. 356] in both species. L-leucine acted in the same way on *N. rustica*. On tobacco alloisoleucine was more effective than isoleucine in the production of frenching, and on *N. rustica* the order was alloisoleucine, leucine, isoleucine. L-alloisoleucine was four times more effective (minimal range 2 to 8 p.p.m.) than L-isoleucine on tobacco. Trials with a thermostable toxin from *Bacillus cereus* [loc. cit.] resulted in the development of frenching.

Sukorceva (Mme K. D.) & Krivina (Mme V. G.). **Cooperation between science and industry.**—*Sad i Ogorod* (*Orchard and Garden*), *1951*, 4, pp. 49–53, 1951. [Russian. Abs. in *Plant Breed. Abstr.*, 22, 1, p. 152, 1952.]

Tamanec (Tamanj), a recently developed mid-season tomato, showed resistance to big bud [virus: *R.A.M.*, 30, p. 348] and [unspecified] fungus diseases and produced good-quality fruit in varietal trials in the Grozno Province and in Northern Osetia and Kabardo. The early varieties Majak (Lighthouse), Pervenec (First Born), Černomorec (Black Sea Littoral), and Skorospelyĭ 288 (Early 288) were also resistant to the virus.

Alvarez-García (L. A.) & Adsuar (J.). **On the occurrence of a Tomato disease in Puerto Rico resembling big bud (Chlorogenus australiensis Hol.).**—*J. Agric. Univ. P. R.*, 34, 4, pp. 327–332, 4 figs., 1 graph, 1950. [Received September, 1952.]

This is a preliminary report on a tomato disease in Puerto Rico resembling big bud virus [*R.A.M.*, 30, pp. 215, 598; cf. preceding abstract], first reported there in January, 1945, when it appeared on 16 out of 3,040 plants (0·5 per cent.) grown experimentally at the Station. From January to April, 1946, 14 per cent. showed various stages of infection. In extreme cases young plants are completely denuded of foliage. Enlargement of the calyx, as reported from Australia [ibid., 13, p. 62], did not occur.

During March and April, 1945, the virus was transmitted successfully by budding, side grafting, and inarching whenever union of scion and host tissue was secured. The percentage infection fluctuated from 60 to 80 in young, fast-growing Marglobe tomatoes, the best results being obtained when buds were taken from plants with well-advanced symptoms. Infection became apparent within 30 to 40 days.

Rodríguez Landaeta (A.). **Contribución al estudio de la 'viruela' del Tomate en Venezuela.** [A contribution to the study of Tomato leaf spot in Venezuela.] —*Agron. trop., Maracay*, 1, 4, pp. 251–267, 2 figs., 1 graph, 1952. [English summary.]

Since first reported from Venezuela *Septoria lycopersici* [C.M.I. map No. 108; *R.A.M.*, 6, p. 470] has become steadily more destructive on tomato and is of economic significance, having been perpetuated in the tomato-growing areas by lack of hygienic cultivation. The disease now affects the Andes States, and those of Yaracuy, Carabobo, Miranda, and Portuguesa, but chiefly Aragua and the Federal district.

A correlation exists between size of spot and number per leaf. In the Rutgers, Criollo, and Marglobe varieties spot size decreased as the number on the leaf surface increased, irrespective of leaf size. Spots were concentrated primarily in the apical portion of the leaf.

In experiments at the Division of Phytopathology, National Institute of Agriculture, Maracay, the disease was largely controlled [ibid., 29, p. 439] in inoculated seedlings by spraying them ten times at eight-day intervals with 2 per cent. TP-13 [ibid., 31, p. 479] or Bayer Bordeaux at 0·3 per cent. With the former no new spots developed after treatment though the lower leaves, which had been attacked beforehand, dropped. With Bordeaux a few spots were observed on the lower leaves. Similar results were obtained when these materials were applied during the incubation period after inoculation. Further experiments gave no clear-cut confirmation that the disease is transmitted by seed or that it may be controlled by seed treatment.

Gopalkrishnan (K. S.) & Jump (J. A.). **The antibiotic activity of thiolutin in the chemotherapy of the Fusarium wilt of Tomato.**—*Phytopathology*, 42, 6, pp. 338–339, 1 fig., 1 graph, 1952.

Particulars are given of experiments at the University of Notre Dame, Indiana, demonstrating the efficiency of thiolutin [*R.A.M.*, 31, p. 335] at concentrations of 10, 20, 40, and 80 p.p.m. in the control of tomato wilt (*Fusarium* [*bulbigenum* var.] *lycopersici*) [see next abstract] on young, soil-free plants of the Bonny Best variety in flasks of Knop's solution. At the higher levels the plants showed distinct stunting and foliar epinasty. The pathogen was isolated occasionally from the roots and stems of plants treated with the lower but not with the higher thiolutin concentrations. A further experiment yielded evidence of inactivation of the antibiotic in the soil, which was attributed largely to the substantial clay fraction.

Promising new southern Tomato named Homestead.—*Seed World*, 71, 8, p. 44, 1 fig., 1952.

A new tomato variety, Homestead, developed by the U.S. Department of Agriculture at the Charleston Laboratory, Florida, from crosses involving Victor, Pan America, Rutgers, and Dobbie's Champion, is reported to be available for autumn and winter plantings. In tests over three years at the Homestead, Fort Pierce, and Gainesville Stations and in other southern States this variety was resistant to wilt [*Fusarium bulbigenum* var. *lycopersici*: *R.A.M.*, 32, p. 106 and preceding abstract] and highly productive.

Bonde (R.) & Murphy (Elizabeth F.). **Resistance of certain Tomato varieties and crosses to late blight.**—*Bull. Me agric. Exp. Sta.* 497, 15 pp., 1 fig., 1952.

Results are given of studies covering a three-year period, carried out at the Aroostook Farm, Maine, to find or develop tomato varieties which are both early maturing and resistant to blight (*Phytophthora infestans*) [*R.A.M.*, 31, p. 636].

In the 1949 greenhouse trial for foliage resistance, of the 21 commercial varieties tested Danmark, Early Dwarf, FNC 45, Guatemala, Mexico 38211, and Red Cherry were immune or highly resistant. A high degree of resistance was also shown by the F_1 progenies of Red Cherry × *L. pimpinellifolium* (susceptible) and F_1 and F_3 of Red Cherry × Danmark. Of the 11 varieties and the progenies of several crosses subjected to natural field infection in 1950, only Red Cherry showed both foliage and fruit resistance; Danmark × Red Cherry progenies were resistant; backcrossing to Danmark lowered foliage resistance. In 1951 nine varieties and the progenies of four crosses involving a Red Cherry parent were subjected to a severe field epidemic; Scarlet Dawn, New Hampshire 50, Danmark, and FNC showed some fruit resistance (0 to 8 per cent. decay), but not always corresponding foliage resistance (16 to 94 per cent. defoliation); 55 F_3 progeny of Danmark × Red Cherry had minimum fruit decay and manifested foliage resistance in August, more than half the plants being less than 10 per cent. defoliated in September. Backcrossing to Danmark and Trellis 22 (a large-fruited, early maturing variety) increased both fruit decay and foliage lesions. Resistance in Red Cherry appears to be dominant.

Hyams (E.). **Booster feeding—in practice.**—*Fruit Gr.*, *1952*, 2969, pp. 943–944, 1952.

The recently described home-made Bordeaux mixture containing copper nitrate [*R.A.M.*, 30, p. 557] was effective in a small garden-scale trial against potato and tomato blight [*Phytophthora infestans*: ibid., 31, pp. 625, 635] in the south of England.

Consultas. [Consultations.]—*Gaz. Agric. Moçamb.*, 4, 38, pp. 190–192, 1952.

In reply to a correspondent it is stated on p. 192 that some tomatoes submitted for inspection to the Mozambique Agricultural Service were attacked by *Xanthomonas vesicatoria* [cf. *R.A.M.*, 30, pp. 213, 362].

Stapp (C.). **Eine neue Infektionsmethode mit Bacterium michiganense, dem Erreger der bakteriellen Welkekrankheit der Tomaten.** [A new method of inoculation with *Bacterium michiganense*, the agent of the bacterial wilt disease of Tomato.] —*Phytopath. Z.*, 18, 1, pp. 111–113, 1 fig., 1951. [Received 1952.]

From the Brunswick branch of the Biological Institute the author describes a new, expeditious method for the inoculation of tomatoes with *Bacterium* [*Corynebacterium*] *michiganense*, which is very destructive to the crop in Germany [*R.A.M.*, 17, p. 213]. The roots of seedlings 12 to 13 cm. in height, which have been growing in a loose sand compost-soil peat mixture in pots in the greenhouse, are rinsed in water, half the roots cut back for 1 to 2 cm., and the entire plants immersed for an hour at room temperature in an aqueous suspension of the pathogen from a three-day-old bouillon-agar culture in a bath (in which 50 to 100 plants can be inoculated at a time). The plants are re-potted and the first symptoms may be expected after eight to ten days when highly virulent strains are used and after a fortnight to three weeks with milder ones. This procedure gave successful results even in tests performed in the autumn of 1949. Attempts in 1950 to infect young tomato plants with *C. sepedonicum* by this improved method gave uniformly negative results [cf. ibid., 10, p. 52].

Gould (W. A.). **Rot and foreign matter in Tomatoes must go if a quality product is to be packed.**—*Food Pack.*, 33, 7, pp. 36, 42, 47, 55, 1 fig., 1952.

Pleading for higher standards in the quality of tomatoes intended for canning or processing in the United States, the writer gives directions for careful sorting and grading of the raw product to eliminate culls and fruits decayed through the action of [unspecified] fungi, bacteria, viruses, or physiological factors; washing by means of flumes, soaker tanks, or high-pressure spray (with a roller conveyor or flexible

steel mesh belt); and the final trimming, which should be supplemented by microscopic analyses of moulds and rots to ensure compliance with the rulings of the Food and Drug Administration.

CLAPPER (R. B.). **Breeding and establishing new trees resistant to disease.**—*Econ. Bot.*, 6, 3, pp. 271–293, 1952.

A four-page bibliography forms the basis of this survey of the principles governing the breeding and establishment of disease-resistant trees in the United States and their application to the control of chestnut blight (*Endothia parasitica*) [*R.A.M.* 31, p. 463], white pine blister rust (*Cronartium ribicola*) [ibid., 30, p. 496], Dutch elm disease (*Ceratostomella ulmi*) [ibid., 28, p. 653], elm phloem necrosis [ibid., 31, p. 228; 32, p. 42], *Albizzia julibrissin* wilt (*Fusarium oxysporum* f. *perniciosum*) [ibid., 28, p. 365], and a number of fungi attacking poplars.

VAN DEN ENDE (G.). **Een bladvlekkenziekte voorkomend op de Populieren, veroorzaakt door Septotinia populiperda Waterman & Cash.** [A leaf spot disease occurring on Poplars, caused by *Septotinia populiperda* Waterman & Cash.]—*Tijdschr. PlZiekt.*, 58, 2, pp. 54–59, 3 figs., 1952. [English summary.]

The fungus isolated at the 'Willie Commelin Scholten' Laboratory, Baarn, from poplar leaves affected by extensive light to dark brown blotching in several nurseries at Hoog Keppel, Holland, in June, 1950, was identified as *Septotinia populiperda* [*R.A.M.*, 31, p. 638]. The conidia measured 20·3 to 34·9 by 6 to 10·2 μ, the spermatia 3·2 to 4 by 2·2 to 2·8 μ, the apothecia $\pm$3 mm. in diameter, the asci 130 by 7·5 μ, and the ascospores 9·5 to 11·2 by 4·5 to 5·7 μ. These dimensions are also reasonably close to those recorded by Whetzel for the type species *S. podophyllina* (*Mycologia*, 29, pp. 128–146, 1937), no morphological difference being distinguishable between them. The fungus was invariably associated with insect injuries, through which it entered the leaves. Species affected by the blotch included *Populus candicans*, *P. brabantica*, *P. deltoidea*, *P.* [*canadensis* var.] *serotina*, *P. robusta*, *P. gelrica*, *P. berolinensis*, and *P. suaveolens*.

JOHANNES (H.). **Septogloeum populiperdum sp. n. als Erreger eines Pappelsterbens.** [*Septogloeum populiperdum* n.sp. as agent of a dying-off of Poplar.]—*Phytopath. Z.*, 17, 4, pp. 406–410, 5 figs., 1951. [Received 1952.]

This is an amplified account of *Septogloeum populiperdum* n.sp., the agent of a dying-off of nursery poplars in Brunswick, Germany [*R.A.M.*, 31, p. 534], including a Latin diagnosis [not previously given]. It differs from the two species of *Septogloeum* hitherto recorded on poplar, namely, *S. tremulae* v. Höhn. (*SB. Akad. Wiss. Wien*, p. 39, 1903) and *S. rhopaloideum* [*R.A.M.*, 8, p. 66], in its conidial dimensions.

OLIVIER (DOROTHEA). **Progress in the study of the Silver-tree disease.**—*J. bot. Soc. S. Afr.*, 37, pp. 18–19, 1951.

Botryosphaeria ribis was identified as the fungus responsible for the recent sudden and widespread death of silver trees [*Leucodendron argentium*] at Kirstenbosch and Claremont, South Africa. This disease is characterized by wilting and at the base of the trunk is a patch of dead bark which extends into the root system, many of the smaller roots being killed before the leaves begin to wilt. One- and two-year-old trees were successfully infected by inserting elm wood splinters inoculated with pure cultures of the fungus into slits cut in the bark of the young trees and binding the wound with grafting tape. The inoculated plants wilted and died within four to six weeks and the fungus could be reisolated from any part of the dead tree. Primary infection, however, still remains mysterious, but is believed to take place

above soil-level, the fungus growing simultaneously down into the roots and up through the stem. The fungus spores may be blown by wind into the small wounds in the bark caused by beetles, or they may be carried by these beetles from diseased to healthy trees. Cutting down trees immediately they show signs of wilting without leaving any stumps above ground level and burning infected material appear to be the only possible means of control at present.

Příhoda (A.). **Rhabdocline pseudotsugae Sydow ohrožuje pěstování Douglasek v ČSR.** [*Rhabdocline pseudotsugae* Sydow threatens Douglas Fir cultivation in Czechoslovakia.]—*Ochr. Rost.* [*Plant Prot., Prague*], 23, 3, pp. 215–218, 1 fig., 1950.

Severe attacks by *Rhabdocline pseudotsugae* [*R.A.M.*, 31, p. 41] were observed on young Douglas fir trees [*Pseudotsuga taxifolia*] at Pisek, Czechoslovakia, in 1940 and the disease has since been reported from other localities. The author draws attention to the fact that the whole future of *P. taxifolia* in Czechoslovakia is threatened and it is important that further spread of infection should be prevented.

Zycha (H.). **Die Phomopsis-Krankheit von Douglasie und Japanlärche.** [The *Phomopsis* disease of Douglas Fir and Japanese Larch.]—*Forstw. Cbl.*, 71, 3–4, pp. 65–79, 10 figs., 1952.

Incidental observations in west German forests revealed an unexpectedly high incidence of *Phomopsis pseudotsugae* [*R.A.M.*, 29, p. 184; 31, p. 360] on *Pseudotsuga taxifolia* and Japanese larch (*Larix leptolepis*). Information on the symptoms, course, distribution, economic importance, and etiology of the disease and the life-history of the pathogen are presented with reference to 23 contributions to the literature.

P. pseudotsugae is capable of local destruction of the cortex of 15- to 30-year-old trees but seldom kills its hosts, though the topmost branches of saplings may die off as a result of infection, probably following frost damage. The pathogen does not overwinter in the trees and therefore the cankers heal. Penetration of wounded cortex is effected between the autumn and the spring, so that cutting and pruning operations should be performed during the summer.

P. pseudotsugae has rarely been observed in Germany, though most likely present in the country for many years. Of late, however, the cultivation of its hosts has been widely extended and more intensive studies on the potential importance of the fungus and possibilities for its control are consequently indicated.

Bose (S. R.). **Identity of Polystictus (= Polyporus = Trametes) cinnabarinus (Jacq.) Fr. with Polystictus sanguineus (L.) Fr.**—*Nature, Lond.*, 170, 4337, p. 1020, 1952.

Cultural studies of *Polyporus cinnabarinus* (*Trametes cinnabarina*) [*R.A.M.*, 27, p. 449; 31, p. 413] and *Polystictus sanguineus* [ibid., 30, pp. 118, 397] in malt extract agar slants in the Botanical Laboratory, Carmichael Medical College, Calcutta, demonstrated important and constant differences between them. Usually the hyphae of *P. sanguineus* develop red wall pigments [ibid., 21, p. 36] fairly soon, while the vegetative hyphae of *Polyporus cinnabarinus* remain uncoloured. Only the pore areas of the latter with developing basidia initials became red. No hyphal fusions were observed between paired cultures of the two species on malt agar coated slides, while on plates *Polystictus sanguineus* grew much faster and in three days surrounded a *Polyporus cinnabarinus* colony started at the same time, leaving a zone of aversion. From these studies it is concluded that the two species are quite distinct.

Bagchee (K.). **A review of work on Indian tree diseases and decay of timber and methods of control.**—*Indian For.*, 78, 11, pp. 540–546, 1952.

Measures are indicated for the control of the major diseases of sal (*Shorea robusta*), including 'unsoundness' or hollow heart due to *Fomes caryophylli*, *F.* sp., and *Trametes incerta* [*R.A.M.*, 18, p. 642], root and collar rot due to *Polyporus shoreae* [loc. cit.] and *F. lamaensis* [ibid., 19, p. 134], and stem canker (*Hymenochaete rubiginosa*), which are threatening forests of this species in India. Immediate protection from fire, frost, and drought should be given to young trees and diseased ones destroyed. Stumps should be examined for rot during coppice felling and rotted standards rejected. Encouraging frost-hardy and volunteer species may help to re-establish sal which is on the decline.

Fungi attacking teak in southern India are briefly described. These include *Uncinula tectonae* and *Phyllactinia corylea*, which become epidemic under conditions of high temperature and humidity, the former causing premature and sometimes complete defoliation, while the latter is particularly prevalent on teak growing near *Dalbergia sissoo*, its primary host. Canker (*Nectria haematococcus*) follows frost injury. Recommendations for the control of *Cronartium himalayense* [ibid., 31, p. 524] on *Pinus longifolia*, *C. quercuum* [ibid., 29, p. 589] on *P. insularis*, and *Peridermium cedri* [ibid., 8, p. 77] on *Cedrus deodara* are eradication of the weed host and the growing of conifers and broad-leaved species together in new stands. Recent surveys in the Himalayas have revealed an increase in the root and collar rot diseases of *C. deodara*, *Pinus excelsa*, and *Picea morinda* due to *Polyporus circinatus* [ibid., 31, p. 92], *Fomes annosus* [ibid., 17, p. 278], and *P. schweinitzii* [C.M.I. map No. 182], respectively.

McNeil (D.). **Creosote for wood preservation. Chemical composition and efficiency.**—*Chem. Trade J.*, 130, 3395, pp. 1517–1518, 1952.

This is an abridged version of a paper presented at the Second Convention of the British Wood Preserving Association, held at Cambridge on 23rd and 24th June, 1952, in which the author discusses new developments in the chemical composition of creosote [cf. *R.A.M.*, 32, p. 51] under the headings of flexibility of production method, British and U.S. specifications, influence of carbonizing conditions, types of creosote oil, vertical retort creosote, and proposed new test for adulteration.

Lohwag (K.). **Der Hausschwamm Gyrophana lacrymans (Wulf.) Pat. und seine Begleiter.** [The house fungus *Gyrophana lacrymans* (Wulf.) Pat. and its concomitants.]—*Sydowia*, 6, 1–4, pp. 268–283, 1952.

Following a brief survey of some outstanding contributions to the literature on lignicolous fungi, the author describes the prevailing situation in Vienna in respect of dry rot (*Merulius lacrymans*) and other agents of decay in dwelling-houses. Before the second world war dry rot was largely confined to damp cellars, but air-raid damage provided favourable conditions for its more extensive development, and there are now sites in severely bombed areas which serve as foci of infection [cf. *R.A.M.*, 24, p. 393; 28, p. 369]. *M. lacrymans* is responsible for 80 to 90 per cent. of the total rotting of structural timber [cf. ibid., 31, p. 154]. Next in order of importance come *Coniophora cerebella* [*C. puteana*], *Poria vaillantii*, *Lenzites sepiaria*, *L. abietina* [ibid., 30, p. 441], and *L. trabea* [ibid., 30, pp. 352, 552, *et passim*], while intensive attacks by *P. xantha* [ibid., 28, p. 369] have also been observed. *Polyporus* [*Fomes*] *roseus* [ibid., 31, p. 215] developed in the built-in wood between floor and ceiling of a bombed house constructed in 1912–13, where it had evidently remained viable for over 35 years, since there was little likelihood of contamination from outside [cf. ibid., 29, p. 3]. Other fungi found in Viennese houses include *M. pinastri* [ibid., 30, p. 132], *Stereum hirsutum*, *P. squamosus*, *P.*

caesius [ibid., 30, p. 97], *P. adustus* [loc. cit. *et passim*], *Polystictus versicolor*, *Daedalea quercina*, *Trametes serialis*, *Ganoderma lucidum*, *Poria undata* [ibid., 26, p. 433], *Schizophyllum commune*, and *Paxillus panuoides*. In conclusion, an annotated list is given of house fungi in general, based on personal experience and a survey of the literature.

VERRALL (A. F.). **Decay of wood siding is preventable.**—*Sth. Lumberm.*, 182, 2274, pp. 55–57, 1951. [Received 1952.]

The results of an examination of houses for decay of wood siding [*R.A.M.*, 29, pp. 69, 597; 32, p. 48] in 15 different localities in the southern States of the United States are briefly reviewed, the probable reasons for the decay given, and the appropriate control measures recommended. These include the use of clean, kiln-dried or treated, fungus-free lumber and construction so designed as to restrict water entry and allow rapid drying of any wood wetted by rain seepage. In addition, breathing-type sheathing papers, gutters, and roof overhang where practicable are strongly recommended. When heavily stained lumber must be used where it might absorb water at the joints the application of pentachlorophenol or copper naphthenate in mineral spirits immediately after sawing on the site can give a good protection.

[This information also appears under the title 'Permanence for wood siding' in *Spec. Release Div. For. Path., U.S. Dep. Agric.*, 36, 7 pp., 3 figs., 1951.]

Proceedings—forty-seventh annual meeting of the American Wood-Preservers' Association.—Washington, D.C., 510 pp., 2 pl., 16 figs., 39 graphs, 9 charts, 1 map, 1951.

These proceedings [cf. *R.A.M.*, 30, p. 499] of the meeting held in Chicago, Illinois, 24th to 26th April, 1951, comprise papers on all aspects of timber preservation in the United States [see next abstract], including the chemical composition of creosote, its toxic elements, and the preservative penetration in Douglas fir [*Pseudotsuga taxifolia*] poles in relation to sapwood thickness and longitudinal penetration of heartwood, supplemented by the usual addenda and indexes.

DUNCAN (CATHERINE G.) & RICHARDS (C. AUDREY). **Evaluating wood preservatives by soil-block tests: 3. The effect of mixing a coal tar creosote and a pentachlorophenol solution with a petroleum; a creosote with a coke-oven tar or pentachlorophenol solution. 4. Creosotes.**—*Proc. Amer. Wood Pres. Ass.*, 47, pp. 264–274, 275–287, 7 graphs, 1951.

Further soil- [pine] block tests [cf. *R.A.M.*, 30, p. 552] were made using only *Lentinus lepideus* (Madison 534) [ibid., 32, p. 1] and *Lenzites trabea* (Madison 617) [ibid., 31, p. 361]. A solution of 5 per cent. pentachlorophenol [ibid., 31, p. 311 and preceding abstract] in heavy gas oil mixed with Seguro petroleum to obtain approximately 4, 3, 2, and 1 per cent. of pentachlorophenol decreased in effectiveness in a manner similar to that of a standard coal-tar creosote mixed with 20, 40, 60, and 80 parts of the same petroleum, but the decrease was considerably more than the calculated reduction due to dilution alone. A coal-tar creosote mixed with 40 parts coke-oven tar was more effective than when mixed with 40 parts Seguro petroleum. Less creosote or pentachlorophenol was needed for equally effective preservation when both were present in a 50:50 mixture than when used separately.

Two separate tests, differing only in the type of permanence test employed, were run with sapwood blocks of longleaf pine (*Pinus palustris*) to evaluate the effect of variations in the composition of creosote on its preservative value, the above two test fungi and *Poria monticola* being used. Fifteen oils were employed, the blocks being tested after leaching and after weathering. The retention

thresholds after leaching were generally less than after conditioning in a room at 80° F. and 30 per cent. relative humidity. As was expected, the thresholds after weathering out-of-doors were higher than for the conditioned blocks. The results from the weathered blocks indicated that creosotes made from coal-tar were more effective as preservatives than coal-tar itself; in general the effectiveness of the straight-run domestic creosotes decreased from low to high residue; it was not impaired by reducing the tar-acid or naphthalene content or both; mixtures of heavy fuel oil or coal-tar with medium-residue creosote, low in tar-acids and naphthalene, were not as effective as creosote alone, though less creosote was needed in the mixture with coal-tar. The two English creosotes, alone or mixed, were more effective than the straight-run domestic creosotes. For comparison the same oils are being used in stake and post tests, the results of which are still awaited.

MEYER (F. J.) & GOOCH (R. M.). **Copper 3-phenylsalicylate. New preservative for special applications to wood.**—*Industr. Engng Chem.* (*Industr.*), 44, 7, pp. 1586–1589, 2 figs., 1952.

From experiments at the Biochemical Research Department, Dow Chemical Company, Midland, Michigan, copper 3-phenylsalicylate [*R.A.M.*, 32, p. 93] appears to meet the requirements of a preservative applicable to wood coming into contact with either seeds and plants or food, for both of which purposes creosote and pentachlorophenol are unsuitable. Copper-3-phenylsalicylate proved to be effective against moulds, represented by *Aspergillus niger*, *Penicillium digitatum*, and *Chaetomium globosum*, and the decay fungi *Lenzites trabea*, *Poria monticola* [see preceding abstract], *Hormiscium gelatinosum*, and *Ceratostomella pilifera*. The compound is non-phytotoxic, imparts no objectionable odour or flavour to fruits or vegetables, and carries no risk to health.

MARSDEN (D. H.). **Preparation of slide-mounts to study distribution of preservative material in wood.**—*Phytopathology*, 42, 6, p. 300, 1 fig., 1952.

The following method for the preparation of thin sections of creosoted wood for histological studies of preservative penetration and distribution was elaborated in a joint study at the Biological Laboratories, Harvard University, and Shade Tree Laboratories, University of Massachusetts. Sections 5 to 30 μ thick in water are treated with a vacuum pump to remove air bubbles and mounted directly in dark, water-miscible Karo corn syrup. Mounts prepared in this way have remained in perfect condition for over two years, with the colour and location of the preservative essentially unchanged in the wood elements.

Slides of serial sections are necessary for studies on the penetration of the wood by fungi and bacteria in relation to distribution of the preservative. One serial section may be mounted in Karo syrup and another extracted before staining or stained differentially without extracting the preservative to reveal the nature and distribution of the invading micro-organisms.

SARASOLA (A. A.) & GARESE (P.). **Tratamiento de la semilla de Remolacha azucarera contro Pythium ultimum, con altos concentraciones de sulfato de cobre.** [Treatment of Sugar Beet seed against *Pythium ultimum* with high concentrations of copper sulphate.]—*Phyton*, 2, 1, pp. 36–44, 2 pl., 1952. [English summary.]

A tabulated account is given of experiments at the Faculty of Agronomy, La Plata, Argentina, in which the germination of sugar beet fruit clusters was stimulated and the incidence of damping-off (*Pythium ultimum*) reduced by 24 hours' immersion in copper sulphate solutions [cf. *R.A.M.*, 26, p. 573] at concentrations up to 8 per cent., the best results being given by the highest dosage.